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STEVENS ON STOWAGE

SEVENTH EDITION

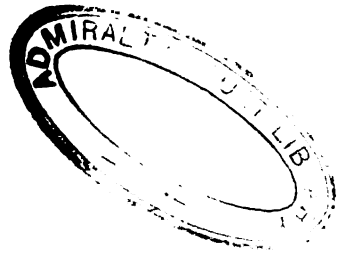


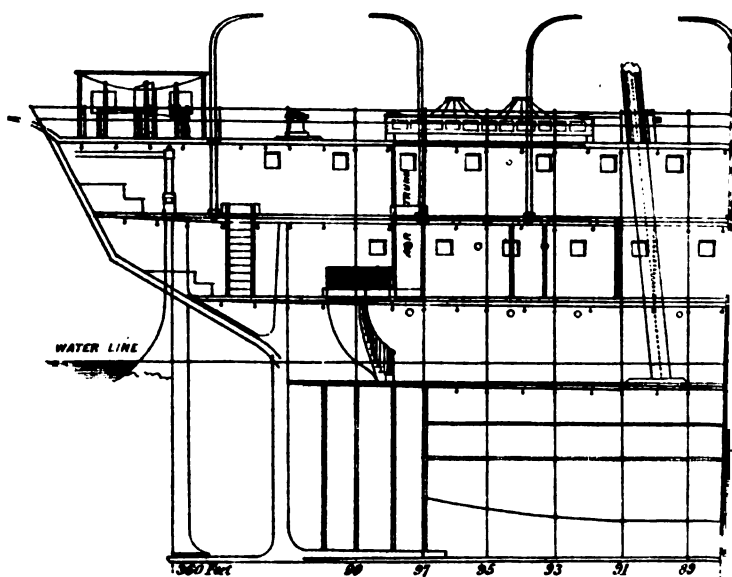
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ON
THE STOWAGE OF SHIPS
AND
THEIR CARGOES:

WITH INFORMATION REGARDING

Freights, Charter-Parties, &c., &c.,

BY

ROBERT WHITE STEVENS,

Associate Member of the Institute of Naval Architects.

SEVENTH EDITION.

LONGMANS, GREEN, AND CO.,

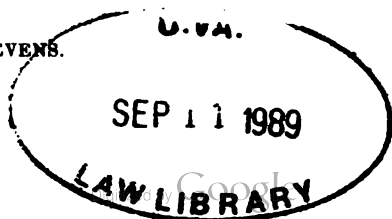
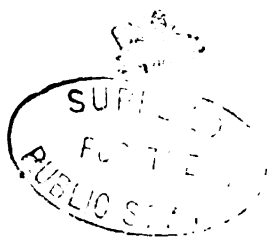
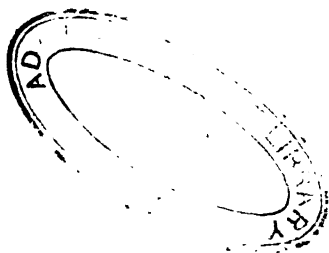
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1894.

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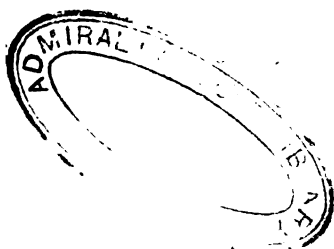
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PLYMOUTH :

R. WHITE STEVENS, PRINTER, PARADE.



P R E F A C E .

IN the preface to the First Edition of this work, communications were solicited from shipowners, masters, merchants, and manufacturers. That request has been complied with most fully, and in gratefully acknowledging the favours of his correspondents, the author begs for a continuance, especially on the subject of those freights which may require further explanation, on the new commodities which are occasionally coming into notice, and on the trade of those ports which have been but recently opened. He has also much pleasure in acknowledging the assistance received from several scientific friends, from the Board of Trade, the Board of Admiralty, the Victualling and Transport Boards, the Commissioners of Emigration, and the Underwriters at LLOYD'S in London and in Liverpool, and from various other public departments.

In preparing this work the following authorities have been consulted :

McCulloch's Dictionary of Commerce.
HARRISON's Freighter's Guide.
GORDON's Charterer's Companion.
Baltic Shipmaster's Guide.
SEDGWICK's Golden Hints to Young Mariners.
LOBRIMER's Letters to a Master Mariner.
MURPHY's Nautical Routine.
BRADY's Kedge Anchor.
The Mate and his Duties.
LEE's Laws of Shipping.
MANLEY HOPKINS on Average.
Capt. Y. FEENSTRA's Hand Book of the River Plate.
Mercantile Magazine.
Maritime Notes and Queries.
Stowage of Grain, by MACKIE.
Coal Cargoes, by RUNDL.
The Times.
Shipping and Mercantile Gazette.

TESTIMONIALS.

H. M. ROYAL NAVY.

ADMIRALTY, 8th February, 1867.

Mr. ROBERT WHITE STEVENS, Author of *Stowage, Plymouth*. Sir, I am commanded by my LORDS COMMISSIONERS of the ADMIRALTY, to acquaint you that they have given orders for your work entitled "*Instructions on the Stowage of Ships and their Cargoes*," to be furnished to the Libraries of each of Her Majesty's Dock Yards.

Yo. mo. ob.

W. G. ROMAINE.

BOARD OF TRADE, 7th February, 1867.

Mr. R. W. STEVENS is requested to be so good as to forward, addressed to the Assistant Secretary, Marine Department, Board of Trade, a copy of the Latest Edition of his "*Instructions on the Stowage of Ships*." Similar orders have been received from Rear-Admiral HALSTEAD, Secretary at LLOYD'S, London, the General Shipowners' Society, Merchant Banking Co., Home and Colonial Insurance Co., the principal Dock Companies, and the Underwriters' Associations at Liverpool, Glasgow, Cardiff, Topsham, &c., &c.

Capt. HUGH MAXIMILIAN ELLIOT, Royal Navy.

Having seen the book and approved of it, courteously opened a correspondence with the author, gave him the advantage of his experience, and offered (20th September, 1866) any further assistance.

Vice-Admiral WILLIAM GRIFFIN,

Writes, 23rd January, 1867: "Your valuable book does you infinite credit. It will be a lasting monument of your indomitable spirit and deep research into all matters relating to the commerce of the world. This work will be highly prized by the Mercantile Marine of all nations, and even by their Navies, as Naval Officers are frequently called upon to adjudicate in matters relating to ships of Commerce, respecting Freight, Stowage, &c. That this work of yours may prove highly advantageous in a pecuniary point of view, is the hearty wish of one who subscribes himself your sincere and attached friend, &c."

Vice-Admiral Sir JOHN KINGCOMBE, K.C.B.,

Says, 27th January, 1867: "Thanks for the perusal of your book, which, no doubt, is highly valuable and appreciated by the Mercantile community. I trust you may be well rewarded for the labour and talent you have bestowed on it. With best wishes, &c."

From Commander CHARLES PARRY, R.N.,

Devonport, July, 1868, Mr. Rr. WHITE STEVENS, "Dear Sir, Your book on Stowage is a first-rate work, as useful to Officers of Ships of War as those in the Merchant Service, so much so, that I have purchased a duplicate copy and sent it to Commodore PHILLIMORE, who takes a great interest in such subjects. I hope it may secure the circulation which it deserves." [Commodore PHILLIMORE was at this time in command of the squadron in the West Indies.]

Mr. E. J. REED, Chief Constructor of the Royal Navy.

In the course of a Lecture on the subject of Armour-Plated Ships, delivered at Plymouth, in December, 1866, said, "It was supposed that by the application of armour plates to ships their rolling at sea would be greatly increased, but the very reverse was the fact. This arose through raising the centre of gravity by the introduction of the upper weights. Now, in all cases, the higher the centre of gravity in reason, the better a ship will behave at sea, whether for naval or mercantile purposes. On the latter subject I need not say much to the inhabitants of Plymouth, for one of their number, Mr. ROBERT WHITE STEVENS, had produced the best work extant on the Stowage of Ships and their Cargoes."

MERCHANT NAVY—SHIPOWNERS.

Mr. WILLIAM BONAR, Secretary to the General Shipowners' Society, Of 12, St. Michael's Alley, Cornhill, writes, 2nd August, 1865: "We are well acquainted with your valuable work and with many other good services you have rendered to the Shipping Interest by your pen."

Messrs. JAMES BAINES & Co. (Black Ball Line),

In a letter dated 1, Leadenhall Street, 26th March, 1866, say, "Enclosed we return the excellent additions you propose to make in your already invaluable work on Stowage, which we always keep by us and often find useful."

Messrs. GEORGE THOMPSON & Co., of Aberdeen, *

In addressing the author, 7th July, 1866, say, "We now return your article on the Stowage of Tea, which we think is very much to the point, and so far as we know, is correct as to the *Queen of Nations*. To show our appreciation of your work on Stowage, we may mention that we give a copy to each of our captains—twenty of them—besides having recourse to it here and at our office in London."

Messrs. HALL & Co., Builders, of Aberdeen,

Say, October 8, 1866: "Your description of the *Murray* is quite correct and of the *Star of Tasmania*, both of which we built. We consider your work will be of great service to shipowners and to shipbuilders also."

Messrs. JONES BROTHERS, Shipowners, Newport (Mon.)

Write Nov. 23, 1866: "Please send us two copies your Stowage. We shall be glad to be informed when another edition is published. It may encourage you to know that we place your book on board all our vessels." December 19, 1866: "Please send half a dozen copies new Edition." May 29, 1868: "Do you propose a new Edition soon? We will take six of them." In the printed code of instructions to their Masters, this firm adds at foot: "A copy of STEVENS ON STOWAGE is placed on board, and much useful information may be obtained by a careful perusal, to enable you to discharge your trust to your owners, shippers, consignees, officers, and crew."

Messrs. DANIEL LE VISCONTE & Co., of Jersey,

State, January 17, 1867: "One of our masters has shewn us your third edition, and we must say that we have been well pleased by its perusal. Knowing that another edition was in course of preparation, we have waited for the same, and now order one for the use of our office. We presume that the 21s. book includes that contained in the Europe and Grain books. We are, Sir, yours respectfully, &c."

Messrs. WILLIAMSON, MILLIGAN, & Co., of Liverpool,

Write, 35, South John Street, February 11, 1867: "Please send us six copies of your work (full edition, 21s.), and back the books with the names of the following ships:—*Waverley*, *Red Gauntlet*, *Guy Mannering*, *Marmion*, *Lord of the Isles*, and *Knight of Snowdon*. Please send *Marmion* at once, as she sails at the end of this week."

Mr. CHARLES CAPPER, of 9, Mincing Lane, London,

Says, February 12, 1867: "I am much pleased with the new edition of your work, which is invaluable to shipowners, and I shall have pleasure in recommending it."

Messrs. SMITH & FRY, of 58, Fenchurch Street, London,

When writing February 12, 1867, say: "We believe your book would be exceedingly useful to all connected with shipping as a work of reference. We shall have much pleasure in recommending it to our friends whenever we have an opportunity."

Messrs. GEORGE DESLANDES & SON, of Jersey,

Write, February 26, 1867: "Enclosed we send you our cheque on the London Joint Stock Bank, value £1 1s., for your valuable edition on Stowage, which will be of great service to us for reference."

Mr. JOHN B. PALMER (Palmer's Shipbuilding Co.), Newcastle.

Says, 19th June, 1867: "I have looked over your book and beg to offer you my compliments on its usefulness."

Mr. THOMAS B. WALKER, Owner of the barque "Fugitive,"

Writes, 30th July, 1867: "I heartily wish success to your effort in bringing out a work, which if attended to by Shipmasters and their Officers, must, in my opinion, be productive of great good. Pray, Sir, receive the assurance that if there is any information I can procure for you from Masters in my service, or if there is any I can give you myself, as a practical Shipowner, it will afford me pleasure to do so."

Messrs. GEORGE W. JONES & Co., Shipowners, Newport (Mon.),

Order, 6th August, 1867, the latest edition of *Stowage*. 8th August, 1867: "We have your favour of yesterday and book. We shall not fail to recommend the publication to our clients, as it contains much information that is unknown to shipmasters generally." 19th November, 1867: "Please send us five copies of your last edition of *STEVENS ON STOWAGE*, cost of same we enclose. We purpose sending them out to friends in Nova Scotia and New Brunswick, who will highly appreciate the usefulness of the work." 12th September, 1868: "One copy *World 21s.*" 4th December, 1868: "Please send *Stowage* by return of post; we have parted with our copy to a Master of a ship in Liverpool, who was unable to procure it there."

Messrs. GELLATLY, HANKEY, SEWELL, & Co., of Leadenhall Street, London,

Write, 1st May, 1868: "We note your work on *Stowage* is now in its fourth edition, and we shall be glad if you will put our names down for a copy. We have no suggestion to offer with regard to its improvement. As you have gone so fully into details, you must be more acquainted with the subject than ourselves."

Messrs. A. & J. INGLIS, Shipbuilders, Glasgow,

Say, 15th September, 1868: "Your book on *Stowage* we got through your agent here, and we shall try to recommend it wherever we can."

MERCHANT NAVY — SHIPMASTERS.

Capt. ROBERT BOVEY, of the brig "Eugenie,"

Writes, 14th April, 1864: "I have a copy of your work and have often found it valuable for reference."

Capt. GALE, of the ship "Evelyn,"

From Adelaide, 4th April, 1866, says: "Allow me to tell you that your book called STEVENS ON STOWAGE, is one of the finest publications that was ever introduced to the British Mercantile Marine. I have known many little knotty questions decided by it, and satisfactorily proved."

Capt. H. R. ANGEL, of the ship "Verulem,"

Of Wisbeach, from King George's Sound, 28th May, 1866, says: "I have an order for half a dozen copies of your work. Please send them to the London Docks."

Capt. W. H. BISHOP (London and Med. Steam Fleet),

Brixham, 29th May, 1867: "STEVENS ON STOWAGE is the text book of the day."

Capt. W. R. BARWOOD, of the barque "Fugitive,"

Writes, 12th July, 1867: "Your truly valuable work, STEVENS ON STOWAGE, I have been in possession of for several years, and really I consider it a most valuable book, and one that certainly no master should be without. I must truly acknowledge having obtained much useful information from it, and have thus been enabled to give my friends a 'wrinkle' on several occasions. Hoping you may be enabled to compile a further edition, I am, with kind respects, &c."

Capt. THOS. THIRKELL, of the barque "Stormy Petrel,"

After kindly pointing out an error in one of the early editions, says, Glasgow, 3rd August, 1867: "As your work is taken (by at least all my friends) as an authority, I trust you will excuse my thus troubling you; at the same time I shall be glad to give you any information I possess in connection with matters such as you require for your book."

Capt. J. WYVILL, of the barque "Velocidade,"

W. I. Docks, 31st August, 1867: "Dear Sir, I am in possession of your work on Stowage, and find it very useful. I have met with it in Merchants' Offices in China, and have no doubt it is well and deservedly appreciated. I am, &c."

Capt. JOSEPH GINDER, barque "Eaglet,"

Writes, 22nd November, 1867: "I have just gone through your book. It is a most valuable work, not only on Stowage, but on so many points which have been referred to in Courts of Law, &c."

Capt. ROBERT JOSS, of Regent Place, Commercial Road East,
Says, 28th January, 1868: "I have lately heard of your work on Stowage, and have seen one of your examples—a Tea Cargo in the *John Temperley*. I have been a few voyages in the Tea Trade myself, and consider the drawing perfectly correct."

Capt. ALEXR. LOCKE, of the ship "Belted Will," from Canton,
Writes, off Falmouth, 3rd September, 1868: "I will thank you to send me a copy of your book on the Stowage of Cargoes; I have heard it spoken well of."

Capt. R. B. McFARLANE, of the ship "Warrior,"
From Melbourne, 14th December, says, Gravesend, 4th March, 1869: "I have a copy of your book called STEVENS ON STOWAGE, and consider it the best work of the kind I have ever seen. My owners, Messrs. JAMES HENTY & Co., of *Melbourne*, have several copies in their office."

TESTIMONIALS—VARIOUS.

Mr. J. A. HARPER, Secretary at LLOYD'S.

To the Association for the Protection of Commercial Interests, says, September 24, 1866: "I shall be much obliged if you would favour me with three copies of the latest edition of your work on Stowage for the use of this Committee." And, July 30, 1866: "I have much pleasure in acknowledging the receipt of your letter of the 26th, and in forwarding copies of Report on the Spontaneous Combustion of Coal lately issued by the Committee. I beg to assure you that your work on Stowage is as great an authority in this place as it so deservedly is in Liverpool, and I am very glad to hear that a new edition is in the press. On its issue I shall require several copies for this office."

Mr. JOHN V. GREGORY, (with JOHN BOWES, Esq.) Newcastle,
Says, January 26, 1867: "I have received your work on Stowage. A preliminary glance through it is sufficient to show that it is a very valuable book for Shipowners."

Mr. ARTHUR YOUNG, Author of the Nautical Dictionary,
Writes, January 21, 1867: "Your most useful book on the Stowage of Cargoes, came under my attention but recently, and I was not aware of its existence until I learned its value through Messrs. TEMPERLEY, CARTER, & DARKE."

Capt. Wm. WALKER, of the Patent Office, Liverpool.

Writes, September 3, 1867: "Has the Second Edition of your book on the Stowage of Vessels been yet published? If not, please inform me when it will be, as I have found the work so exceedingly useful, and have borrowed a copy of it from a friend so often, that I am ashamed to continue the malpractice."

Mr. BERNARD R. MATTHEWS, LLOYD'S Agent, Melbourne,

Writes under date March 3, 1868: "I have not had time to look through the work, but from a glance I think it will do you much credit, and will be now considered an *Authority*, for we have had many disputes over damage and stowage—the cargoes being so mixed."

From Mr. CLIFTON, a gentleman of much experience in Shipping.

Royal Western Yacht Club, Plymouth, 23rd March, 1868: "Dear sir, all I can say is, that had your book appeared forty years ago, many a young master would have made his fortune, because he would not have returned after the first gale, through bad stowage, and so lost his voyage; in those days there was no steam, and the masters left their ports to meet trade winds. Underwriters would have saved millions. I think you ought to push it with the Admiralty, as there is a screw loose somewhere upon the Stowage of H. M. Ships, or why should they labour so dreadfully. I really compliment you upon the production of such a very able work, and I know a little about ships."

The SHIPPING GAZETTE, 18th March, 1867,

Says: "By this time the work of Mr. ROBERT WHITE STEVENS, of Plymouth, on the Stowage of Ships and their Cargoes, must be tolerably well known, as it has passed through three editions. A fresh issue for 1867, bringing information of new Cargoes and Freightage generally, to the latest date, is now before us. This revised and much extended edition, embraces many points that were not before touched upon. Mr. STEVENS, in a word, appears to have devoted much time, care, and knowledge, in making the new volume a guide for loading, stowing, ballasting, and dunnaging ships. It also contains numerous tables useful to all who have to charter or load vessels."

The SHIPPING GAZETTE, 6th August, 1868.

"Many of our readers are aware that this work, STEVENS ON STOWAGE, in much appreciated by all who are interested in Shipping, and it is not surprising to learn that its merits are also esteemed by other classes. The Science and Art Department of the Committee of Council of Education, South Kensington, have placed Mr. STEVENS' book among the Queen's Prizes offered to Students connected with that valuable Institution. This selection shows that the work possesses, in the estimation of the Committee, information which may be serviceable to the general

scientific reader. The Lords of the Admiralty, some time since, sent copies to all the Schools in the Public Arsenal." [Similar notices appeared in the *Western Mercury*, *Morning News*, and other papers.]

The WESTERN DAILY STANDARD, 6th March, 1869.

"The Author of this work (STEVENS ON STOWAGE), who, as most of our readers are aware, is the Plymouth Correspondent of *The Times*, has just received an unexpected compliment. Capt. M'FARLANE, of the ship *Warrior*, belonging to Messrs JAMES HENTY and Co., extensive shipowners in *Melbourne*, has recently brought home a cargo of colonial produce, and in sending an account of the passage, he says: 'I have seen a copy of your book called STEVENS ON STOWAGE, and I consider it the best work of its kind ever seen. My owners have several copies in their office' Voluntary approbation like the above must be very gratifying to the author. It appears that Capt. M'FARLANE's opinion, and that of his owners, prevails in other ports besides *Melbourne*, for the present edition of the work is nearly disposed of. A Fifth and larger Edition will, we understand, soon appear."

From the SUB-EDITOR of a Daily Newspaper.

February 1st, 1869. "Dear Sir, I return you your book on Stowage, for the opportunity of looking through which I have to thank you very sincerely. You would properly regard as impertinent any attempt of mine to appraise its value; in truth I can only marvel, with an almost ignorant admiration, at the knowledge, industry, and care which have been employed to produce a work whose worth I can recognize, though I cannot render it the justice of an adequate criticism."

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Page	Names of Vessels.	Tons reg.	Tons.	Description.
840	QUEEN, schooner	96	160	Landshipping coal.
316	MERCURE, brig	102	160	Newcastle coal.
210	ACADIAN, brig	122	202	West Hartlepool.
153	ARK, schooner	124	200	Coal.
122	TAMAR, schooner	133	197	New Pelton.
509	RUDOLPH, brigantine	138	225	Coal.
461	FAIRY, schooner	141	230	Coal.
382	TALK HARRIET, brigantine ..	144	220	Shields' steam.
208	OCEAN BRIDE, schooner	144	250	Swansea patent fuel.
121	SOUVENIR, schooner	157	297	Llanelly culm.
			300	Llanelly coal.
			285	Newcastle jarrow.
341	LEADER, schooner	159	260	NEVILLE's hand-picked
				Llanelly.
122	STAR OF THE WEST, schooner	176	280	New Pelton.
717	HERALD, brig	183	290	Coal.
634	WILLEM JACOBUS, brig	185	276	Sunderland steam coal.
476	MARY ELIZABETH, brig	187	330	Scotch coal.
143	BELLE OF DEVON, brig	198	310	Coal.
253	ALLANCE, brig	205	327	Cardiff coal.
559	ADELA, brig	212	380	Allos coal.
560	IRIS, brig	222	320	Cardiff coal.
635	CASTOR, brig	223	285	Cardiff coal.
633	MARY ANN, brig	225	555	Newcastle coal.
593	PHANTOM, brig	249	408	Cardiff coal.
153	EMILY, barque	251	420	Coal, with 40 casks of linseed, &c.
533	ELIZA, barque	257	386	Cardiff coal.
191	RESTORFF ROSENHAGEN, barq.	265	400	Cardiff steam coal.
436	SUNTUM, brig	268	406	Sunderland coal.
673	VELOCIDADE, barque	268	330	Coal.
300	PARTIZAN, brig	290	474	Newport coal.
542	WITCH OF THE TEES, barque	300	420	Newcastle, N.S. Wales.
526	IONA, barque	302	660	Pictou coal.
107	ANN AND SUSAN, schooner ..	340	389	Cardiff.
694	J. W. SPENCER, brigantine ..	350	493	Newport steam coal.
694	STROPHOMENIAN, barque	364	542	Llanelly coal.
638	IONE, barque	364	602	Aberavon coal.
245	CONTEST, brig	372	480	Coal.
637	MOULTAN, barque	372	570	Coal.
302	SIR GEORGE GRAY, barque ..	376	500	Coal.
308	EXCELSIOR, barque	462	700	Coal.
672	CALDEW, barque	482	710	Sunderland coal.
254	MARINUS, barque	512	700	Shields' coal.
664	KELSO, ship	529	800	Coal.
592	MESSINA, barque	551	750	Cardiff coal.
116	RAVENSCLIFF, ship	588	850	Liverpool steam.
306	STAR OF TASMANIA	682	900	Newcastle Coal.
691	COMMISSARY, ship	735	1085	Patent fuel.
520	J. P. WHEELER, ship	855	1500	Coal.
293	GREENWOOD, ship	930	1605	Cardiff coal.
717	JESSIE, brigantine	—	430	Coal.
92	ONLY SON, schooner	—	115	Coal.
690	DR. F. A. S. HUNTER	—	700	Cardiff coal.

By reference to the pages, details of these vessels may be seen.

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TABLE No. I.

FOREIGN MONIES, WEIGHTS AND MEASURES.

VALUE OF VARIOUS MONIES AT PAR.

The price of silver being reckoned at five shillings per ounce.

Russia	100 copecs	1 rouble	s. 2.
Prussia	80 silver groschen	1 Prussian dollar ...	8 1½
Norway	120 skillings	1 specie dollar	2 10½
Sweden	48 skillings	1 rix dollar banco ...	4 6½
Denmark	96 skillings	1 rigsbank dollar ...	1 8
Holland	100 centimes	1 florin	2 2½
Hamburg	16 schillings	1 florin	1 8
France	160 centimes	1 mark	1 5½
Spain	8 reals	1 franc	0 9½
Portugal	1,000 reis	1 dollar plate	8 1½
New York	100 cents	1 milreis	4 8
Rio Janeiro ...	1,000 reis	1 dollar	4 2
		1 milreis	2 7

£1 STERLING EXPRESSED IN VARIOUS MONIES AT PAR.

The price of silver being reckoned at five shillings per ounce.

Russia	6 roubles, 40 copecks	£1 sterling.
Prussia	6 dollars, 27 silver groschen	do.
Norway	4 specie dollars, 42½ skillings	do.
Sweden	12 rix dollars	do.
Denmark	9 dollars, 10 skillings	do.
Holland	11 florins, 97 centimes	do.
Hamburg	13 marks, 10½ schillings	do.
France	25 francs, 22 centimes	do.
Spain	6 dollars, 2½ reals	do.
Portugal	4 milreis, 285 reis	do.
New York	4 dollars, 80 cents	do.
Rio Janeiro	7 milreis, 777 reis	do.

FOREIGN EXCHANGE.

In foreign exchange, one place always gives another a fixed sum, or piece, of money for a variable price, expressed by other coins, the former is called the *certain price*, and the latter the *uncertain price*. Thus London is said to give to Paris the certain for the uncertain when the pound sterling is made exchangeable for a variable number of francs; and to Spain the uncertain for the certain when a variable number of pence sterling is exchangeable for the dollar of exchange. The uncertain price, as quoted at any time, is called the *rate*, or *course of exchange*.

TABLE No. 1.—CONTINUED.

FOREIGN WEIGHTS REDUCED TO ENGLISH.

To Barbary lbs. add 30 $\frac{1}{2}$ cent. for English lbs.	
To Danish lbs. add 4 ditto.	
To Hambro' lbs. add 7 ditto or 105=112 Eng.	
To German lbs. add $5\frac{1}{2}$ ditto—or 106 German=112 Eng.	
To French, Dutch, and Mogadore add 13 $\frac{1}{2}$ cent. for Eng. lbs.	
1 oz. French= $2\frac{1}{2}$ grains. 1 kilogramme=21.5 lbs.	
From Italian lbs. deduct 1-4th part and add 3 $\frac{1}{2}$ cent.	
Naples lbs.; multiply by 12 and divide by 17.	
Venetian lbs.; multiply by 65 and divide by 100.	
151 carats=1 oz. troy.	
Portuguese aroba= 25 lbs. Eng.	Trieste pecab..... 133 $\frac{1}{2}$ lbs.
- quintal.....122 -	Turkish rottola..... 2 $\frac{1}{2}$ -
Russian poods, 63... 1 ton Eng.	- oke 2 $\frac{1}{2}$ -
- 112 lbs. 100 lbs.	- drachms, 100 11 oz. troy.
Spanish aroba 25 -	River Plate pesada... 35 $\frac{1}{2}$ @ 40 lbs.
- quintal 92 -	Batavian picul 135 lbs. 10 oz.
Sicilian quintals 100 133 lbs. Eng.	Japanese ditto 121 -
- rottola, great 1 $\frac{1}{2}$ or 28 ozs.	Manila ditto 140 -

THE POUND WEIGHT FOREIGN

COMPARED WITH THE ENGLISH AVOIRDUPOIS POUND.

Abbeville ... 1.0989	Dieppe..... 1.0989	Paris 1.1235
Amsterdam . 1.1111	England 1.000	Placentia..... 0.72
Ancona 0.78	Ferrara 0.75	Prague..... 1.2048
Antwerp 1.04	Flanders 0.9433	Rochelle 0.8928
Avignon 0.8928	Geneva 0.07	Rome 0.7874
Bologna 0.8	Genoa, gross 0.7	Rouen 1.1069
Bordeaux ... 1.0989	Hamburg .. 1.0865	Seville 0.9259
Bruges..... 1.0204	Leghorn 0.75	Toulouse .. 0.8928
Calabria 0.73	Lisbon..... 1.135	Turin 0.82
Calais 0.9845	Nuremburg... 1.1863	Venice 1.06
Dantzic 0.862	Naples..... 0.71	Vienna 1.23

100 lbs. ENGLISH compared with FOREIGN WEIGHTS.

Antwerp 96.40	Konigsberg ... 96.78	Pillau 92.00
Amsterdam . 91.80	Leghorn 132.17	Rostock 88.75
Barcelona ... 112.65	Lucca 121.84	Rotterdam ... 91.80
Bologna 125.21	Lubeck 93.82	Rouen 87.34
Bordeaux ... 92.58	Malta 58.82	Russia 110.85
Bremen 90.92	Mamel 109.76	or 14 $\frac{1}{2}$ ozs. ea.
Bruges..... 96.40	Milan 138.24	Sicily 142.77
Calais 88.95	Morea 113.49	- rottoli . 67.11
- 107.67	- silks ... 90.79	or 28 ozs. ea.
Dantzic 104.15	- okes ... 37.92	Trieste..... 80.92
Denmark..... 90.72	Morocco 98.57	Tripoli..... 89.17
Emden 91.80	Naples 141.30	Venice 94.80
Gallipoli 100.80	- rottoli. 50.87	- 148.80
Hambro' 93.75	Portugal 98.80	Wiesmar 93.70

TABLE No. I.—CONTINUED.

FOREIGN MEASURES.

Flemish aun or ell = $\frac{1}{2}$ yard Eng.	Imp. qr. 63-5076 kappar . }	Swedish
French ditto .. $1\frac{1}{2}$ "	" 1'7641 tunna . }	"
Ditto metre .. 39 "	" 21'5150 alqueires .	Lisbon
Spanish varra .. 38 "	" 2'9077 hectolitres	France
Turkish pike .. 27 "	" 17'0470 "	Oporto
Russian archines, 100, 60 ells Eng.	" 5'1478 fanegas ..	Spanish
German, E. Country, & Smyrna auns;	" 5'2848 scheffels .	Prussian
divide by 2, deduct $2\frac{1}{2}$ ct. for Eng. ells	" 2'7540 "	Hamburg
Eng. yard 0'4327 canne of 8 pal. Naples	" 2'0904 toender ..	Denmark
" 0'8657 10 " Genoa	" 1'8864 chetwerts.	Russian
" 1'5887 braccia, Leghorn	" 4'7286 metzen ..	Austrian
Imp. gal. 4'5484 litres or kans	" 8'2841 killows ..	Turkish
" 0'8654 almudes, Turkish	" 5'6858 tomili ..	Neapolit'n
" 0'1558 barile oil, Leghorn	" 8'9789 sacks ..	Tuscan
" 0'1097 do. of 60 caraffi, Naples	" 2'4151 muie ..	Sardinian

FOREIGN LINEAL COMMERCIAL MEASURES.

(According to BARON DE PROUBRY.)

inches.	inches.	inches.
Amsterdam ell (m) . 27'17	Frank'ton Maine ell 21'54	Palermo canne (8 p) 76'46
Anvers ell, silk 27'53	Genoa palme 9'81	Parma fathom, silk 23'40
- wool 26'94	Geneva ell 45'02	- wool, cotton, &c 25'34
Berlin ell, old mea. 26'28	Hamburg ell 22'55	Pavia, fathom 23'42
- new measure .. 26'55	Brabant ell 27'21	Petersburg archine. 23'95
Berne ell 21'35	Hanover ell 22'99	Ragusa ell 20'20
Bologne fathom 25'40	Haarlem ell, linen.. 29'23	Riga ell 21'58
Brunswick ell 22'46	- common 26'90	Rome canne (8 pal) 73'42
Bremen ell 22'77	Leipsic ell 22'25	- fath. (4 palmes) 33'39
Cagliari raso 21'61	Leyden ell 26'89	- weaver's (3 pal) 25'04
Carrara fathom 24'39	Lisbon vara 42'02	Rostock ell 22'64
- canne, for wood . 24'59	Lubeck ell 22'71	Stockholm Swed. ell 23'37
- palm, for marble 9'18	Lucca fathom 23'42	Stuttgard ell (Wurt.) 24'18
Cassell, ell 22'41	Madrid ell, 36 sp. in 33'38	Turin raso 23'50
Cologne, ell 22'64	Mantua fathom 25'34	Venice fath. for wool 26'90
Constantinople, lar. 26'84	Milan fathom 23'42	- for silk 25'14
- small measure. 25'50	Modena fathom 25'51	Verona fath., large 25'55
Copenhagen ell 24'71	Munich ell 32'79	- ditto, small 25'29
Cracow ell 24'29	Naples canne (8 pal) 82'52	Vicenza fath., cloth 27'17
Cremona fathom .. 23'42	Neufchatel ell 43'74	- ditto, for silk 25'04
Dresden ell 23'30	Nuremburg ell 25'84	Vienna ell (Vienna) 30'67
Ferrara fathom, silk 24'97	Ostend ell 27'51	- Upper Austria 31'48
- cotton & linen 26'49	Padua fathom, cloth 26'83	Warsaw ell 23'01
Florence fathom .. 23'39	Ditto for silk 25'09	Zurich 23'62

The palm most in use is the Roman, equal to 0'733 feet. This ancient measure differs in several countries, and at different places in the same country, but the ordinary standard is 8 $\frac{1}{2}$ inches. It is sometimes made to express 9, 10, and 11 inches.

FOREIGN LINEAL MEASURE.

The English foot (12 in.) compared with the foot measure of foreign nations.

Paris foot in. 12 $\frac{1}{2}$	Spain ... in. 12	U. States in. 12	Danish in. 12'504
Amsterdam. 11 $\frac{1}{4}$	Venice 13 $\frac{1}{2}$	China 12 $\frac{1}{2}$	Swedish . 11'733
Antwerp ... 11 $\frac{1}{4}$	Dantzic 11 $\frac{1}{4}$	Another authority says	Grecian... 12'0875
Leyden 12 $\frac{1}{4}$	Copenhagen 11 $\frac{1}{2}$	Paris 12'186	Venetian. 13'954
Strasburg ... 11	Rome 11 $\frac{1}{2}$	Bologna ... 15	Rhineland 12'396
Frankfort ... 11 $\frac{1}{4}$	Greece 12 $\frac{1}{4}$	Lantzic ... 11'328	Strasburg 11'424

TABLE No. I.—CONTINUED.

FOREIGN WEIGHTS AND MEASURES.

100 lbs. FOREIGN compared with ENGLISH AVOIRDUPOIS.

100 lbs. Foreign	Are equal to	lb. Avoir. English.	100 lbs. Foreign	Are equal to	lb. Avoir. English.
C W Amsterdam		•108·98	S W Lisbon and Oporto...		101·18
C W Antwerp		108·66	C W Lubeck.....		106·91
S W Aix la Chapelle		102·97	C W Lyons		101·18
C W Ancona		72·66	C W Lucca		75·26
C W Augsburg		104·32	- Madrid & Cadiz, 1 cwt		101·48
C W Barcelona		88·76	C W Malta		69·80
C W Berlin		103·32	C W Mantua		68·46
C W Bremen		109·90	- Malaga, 1 cwt.....		101·43
C W Breslau		89·41	- Moscow, 1 pud		36·10
C W Brussels		103·09	C W Marseilles		89·95
- Cologne		103·66	S W Messina		70·06
S W Calcutta, 1 maund...		74·66	S W Milan		72·05
S W Cassel		103·14	L W Munich		123·72
- Como		69·82	S W Naples		70·72
L W Constantinople, } 1 cantaro		123·70	S W Palermo		70·00
S W Corsica		108·07	S W Padua		74·82
- Cremona		68·24	- Paris, 100 kilograma.		220·47
C W Dantzic, 82 loths ...		104·67	- Petersburg, 1 pud... ..		36·10
C W Dresden		102·97	C W Ragusa		83·12
C W Ferrara		76·09	S W Rio Janeiro		101·18
S W Florence & Leghorn .		74·86	C W Rome		74·82
C W Frankfort-on-Maine .		103·16	C W Rotterdam		108·93
S W Frankfort-on-Oder... ..		103·32	- Stockholm, 1 stapled		75·00
S W Geneva.....		101·18	S W Strasburg.....		108·99
C W Genoa		69·85	- Smyrna, 1 cantaro ...		138·70
C W Ghent		103·09	C W Trente		74·16
C W Gibraltar ...		102·97	L W Treviso		113·98
C W Hague		108·93	C W Turin		81·84
C W Hamburg		106·81	S W Venice		66·44
L W Hanover		107·94	S W Verona		78·45
C W Havre De Grace.....		108·07	C W Vienna		123·47
C W Leipsic.....		103·16	C W United States.....		100·00
S W Liege		104·73	C W Warsaw		89·41
			S W Zurich		103·60

C.W. means commercial weights; L.W. large; and S.W. small. The second column of figures in English weights are fractions of a hundred— $\frac{1}{100}$.

*AVOIRDUPOIS. In England all articles are sold by avoirdupois except gold, silver, platina, diamonds, and other precious stones, and drugs when sold retail; the excepted articles, and none others, may be sold by troy weight. *Avoirdupois Weight*: 16 drachms 1 ounce ($437\frac{1}{2}$ grains); 16 ounces 1 pound (7,000 grains); 14 pounds 1 stone (14 lbs.); 2 stones 1 quarter (28 lbs.); 4 quarters 1 hundred (cwt.) (112 lbs.); 20 cwt. 1 ton 2,240 lbs.

TABLE No. II.
GOODS PROPORTIONED IN STOWAGE.

		Bulk keel.	Gross weight. tons.	Cubic feet.
17 tons	Ashes.....	1	17-000	850
80 casks	— Pot and Pearl	1	16-000	—
10 tons	Bark, tree.....	1	10-000	—
8 "	— coppice	1	8-000	—
110 tierces	Beef, 8 cwt. each.....	1	16-500	—
8 tons	Bones, calcined in bulk	1	8-000	—
12 "	— manure, &c., in bulk	1	12-000	—
16 "	— best quality, in bulk	1	16-000	—
100 gross	Bottles = 6 per gallon = 19 lbs. weight per dozen, in bulk, glass	1	10-000	—
200 "	Half - bottles = 12 per gallon = 11 lbs. weight per dozen, in bulk	1	11-750	—
80 crates	Bottles, glass, 10½ cubic feet each	1	10-000	—
120 bags	Bread, bags, 1 cwt. each	1	6-000	—
8,000	Bricks, common, ditto Tiles, in bulk	4	21-000	638
7,000	— fire	4	21-000	—
530 firkins ..	Butter, 70 lbs. each.....	1	16-500	850
16 chaldrons .	Cinders, imperial chaldrons	1	10-000	—
8 "	Coal, 53 cwt. each, in bulk	1	21-200	—
	— when compressed in the hold	1	20-000	—
40 tierces ..	Coffee, 7 cwt. average	1	14-000	—
230 bags	— 1½ cwt. average	1	17-250	—
20 hogheads ..	Coppers	1	17-000	—
4-500 tons ..	Cork, Faro	1	4-500	—
8-333 "	Cotton, New Orleans & Mobile, all comp.	1	8-333	—
9-166 "	— best carrying ship	1	9-166	—
4-750 "	— Charleston & Savannah, not comp.	1	4-750	—
7-000 "	— Pernambuco and Maranh	1	7-000	—
9-700 "	— Alexandria, all compressed.....	1	9-700	—
5-000 "	— not compressed	1	5-000	—
17-000 "	Currants	1	17-000	—
16 crates ..	Earthenware, large crates	1	7-000	—
22 "	— mixed	1	9-000	—
28 "	— small	1	10-000	—
140 barrels ..	Flour, 220 lbs. each, 196 lbs. net	1	18-750	—
160 sacks ..	— 250 lbs. each	1	20-000	—
60 crates ..	Glass, 12 tables	1	5-500	—
60 "	— 15 "	1	5-000	—
40 "	— 18 "	1	4-500	—
97 quarters ..	Grain, Wheat	1	21-200	—
88 "	— Tares, beans, peas 68 lbs. "	1	20-000	—
106 "	— Rye	1	21-000	—
108 "	— Seed	1	20-000	—
114 "	— Barley	1	21-000	—
125 "	— Oats	1	16-500	—
26 chaldrons .	Grindstones, mixed sorts	4	21-000	425
10 tons	Hemp and Flax, clean	1	10-000	850
9-107 tons ..	— outshot	1	9-107	—
7-760 "	— half clean	1	7-760	—
5-825 "	— codilla.....	1	5-825	—

NOTE.—For grain, seed, oats, tallow, and wool, see also the Report on Freights at the close of the article grain.

TABLE No. II.—CONTINUED.
GOODS PROPORTIONED IN STOWAGE.

		Bulk keel.	Gross weight. tons.	Cubic feet.
180 barrels ..	Herrings, red	1	11·000	850
144 „ ..	— white	1	21·500	—
17 tons ..	Hides, salted	1	17·000	—
20 hogsheads	Lamp Black	1	7·000	—
120 bags ..	—	1	6·000	—
300 pigs ..	Lead	1	22·000	283
9·444 tons ..	Mats of 400 pieces, Archangel	1	8·500	850
17 tuns	Oil, 252 gallons per tun	1	18,500	—
20 tuns	Oil Cake	1	20·000	—
8 „	Oranges and Lemons, 10 chests, or 20 boxes per ton..	1	10·000	—
100 barrels ..	Pitch, Archangel	1	20·000	—
17 tuns ..	Potatoes, in bulk	1	17·000	—
156 barrels ..	Pork, 2 cwt., each barrel	1	15,000	—
7·2727 tons..	Skins, dried	1	7·2727	—
21 tons	Slates	1	21·000	567
16 „	Soda, and other Alkalies, in casks	1	16·000	850
21 „	— in bulk	1	21·000	—
1·275 mille..	Staves, Baltic, reduced, viz. 1200 pieces, 66 inches long by 1½ thick..			
1·800 „ ..	— Odessa ditto			
1·200 „ ..	— Quebec ditto			
0·840 „ ..	— Baltic rough, 1200 pieces 72 × 3½	1	15·250	—
0·708 „ ..	— Odessa „ 1200 „ 76 × 3½			
1·054 „ ..	— Quebec „ 1200 „ 66 × 2½			
3 885 „ ..	— W. India „ 1200 „ 42 × 1½			
	(The staves to average 6 inches in breadth.			
20 hogsheads .	Sugar, 16½ cwt. average per hogshead ..	1	16 500	—
17 tons	Tallow, gross weight	1	17·000	—
100 barrels ..	Tar, Archangel	1	16·000	—
100 „ ..	— Stockholm	1	16·000	—
196 „ ..	Tar and Rosin, American	1	17·000	—
17 loads	Timber, Baltic squared Fir	1	18·500	—
17 „	— North American ditto	1	13·500	—
17 „	— Birch ditto	1	22·000	—
14 923 loads..	— Masts, round	1	17·500	—
5·1515 stan. hund.	— Deals, 120 ps. 12ft. 11in. × 1½in.	1	17·000	—
4·857 „ ..	— Battens, 120 ps. 12ft. 7in. × 2½in.	1	17·750	—
17 hogsheads .	Tobacco	1	10·000	—
150 carboys ..	Vitriol, Oil of	1	8·000	—
17 tuns ..	Wine, Brandy, or other Spirits, reckoning full gauge of casks=4,284 gallons	1	20·000	—
4·444 tons ..	Wool	1	4·444	—
5·257 „ ..	— compressed	1	5·257	—

According to the London Rates of Freight by inspection, when wheat is 1s. per quarter, beans, peas, and tares should be 1s. 1½d., rye 11d., linseed 10½d., barley 10½d., and oats 9½d.; timber 5s. 8½d. per load; deals 17s. 1½d. per standard hundred; clean hemp and flax 9s. 8½d., oats and hemp 10s. 11d., half-clean hemp 12s. 1½d., codilla 14s. 6½d., and wool 19s. 4½d. per ton.

TABLE No. III.

(PROPOSED)

SHIP-OWNERS' CENTAL SCALE OF PROPORTIONATE RATES OF FREIGHT.

When vessels are freighted by the ton, and no special agreement is made respecting the proportion of tonnage which each particular article shall be computed at, the following shall be the standard, the cental representing 100lbs., avoirdupois.

WHEAT. 100 quarters in bulk of 5 centals to the quarter are equal approximately to 1,000 cubic feet, and to 22 tons weight, and to 45 cubic feet per ton measurement. This practical result is arrived at from wheat in bulk stowing itself in every angle where no measurement goods can be stowed, owing also to the great pressure on the lower parts of the cargo. This applies relatively to all grain cargoes in bulk.

BEANS, Peas, and Tares. To pay proportionate freight to wheat cargoes, according to weight and measurement of the port of export.

BARLEY. 114 quarters of 4 centals to the quarter—equal to 21 tons weight and measurement.

OATS. 125 imperial quarters of 3 centals to the quarter—equal to 16½ tons of weight and measurement.

FLOUR. 8 barrels of 196lbs., equal to a ton of 50 cubic feet.

That the articles, the bulk of which shall compose a ton, to equal a ton weight, shall be computed in weight as follows:

COFFEE, 1,568 lbs. in casks, 1,830 in bags; Cocoa, 1,120 lbs. in casks, 1807 in bags.

PIMENTO, 952 lb. casks, 1,110 bags.

FLOUR. 8 barrels of 196lbs. each. **PIG and bar IRON,** saltpetre, sugar, logwood, fustic. Nicaragua wood, and all heavy dye-wood, copper ore, and all other heavy goods, 20 cwt.

COTTON, COMPRESSED. 50 cubic feet to the ton.

TIMBER. 50 cubic feet to the load.

ASHES, POT AND PEARL. 5 casks equal to 1 ton weight, or 40 cubic feet.

PROPORTIONATE RATE of freight for grain, say—wheat 5s., tares, beans, and peas, 5s. 6d. $\frac{1}{4}$ quarter of 500 centals.

SEEDS, barley, and oats, in proportion to weight and bulk for 500 centals.

SUGAR AND SALTPETRE in bags, coal, salt, copper ore, and all dead-weight, to be computed at the rate of 22 centals to the half ton; all light goods to be computed at the rate of 50 cubic feet to the ton.

Commanders of ships in all foreign ports should personally ascertain the relative weight per ton, compared with the Measurement for stowage, before signing an open Charter, or engaging any particular article not specified in HARRISON'S Freighters' Guide, as the Baltic and Levant scale of proportionate rates are notoriously calculated to deceive the shipowner on open charters.

All ships should by statute law be furnished by the owner with cental weights and scales and calliper measure, also with an oblong scoop measure shaped to approximate the sections of a ship's form, which will give the measurement of a bushel of wheat weighing 62½ lbs., making the quarter of wheat equal to 5 centals, leaving it optional to adopt 20 centals to the ton, or retain 22½ centals to the old ton, which is thus increased by 10 lbs. to facilitate computation.

Tithes and corn rents can easily adjust themselves to the new commercial standard, without any violation of rights or dues.

The introduction of the Cental weights applied to every article of consumption it is evident would be a great boon to the public.

The Cental weight of 100 lbs. will be in use in the LIVERPOOL corn market from the 1st February, 1859.

A Decimal coinage is proposed to follow.

GOLD. 1 Sovereign 500 Cents, $\frac{1}{4}$ -Sovereign 250, $\frac{1}{2}$ -Sovereign 125.

SILVER. Crown, 4s., stamped 100 Cents; $\frac{1}{4}$ -Crown, 2s., 50; $\frac{1}{2}$ -Crown, 1s., 25; 5 Cent pieces.

COPPER. One Halfpenny 1 Cent, Farthing $\frac{1}{4}$ ditto.

TABLE No. IV.

NEWCASTLE STATUTE COAL MEASURE CONVERTED INTO WEIGHT.

AND COMPARED WITH THE REGISTER TONNAGE, N.M. OF SHIPS, SHOWING THE
NUMBER OF CHALDRONS, TONS, OR KEELS OF COAL A VESSEL WILL CARRY, AT
THE RATE OF 14 REGISTER TONS PER KEEL.

Chal- dron.	Ton.	Cwt. °	Keel.	Reg. Ton N.M.	Chal- dron.	Ton.	Cwt.	Keel.	Reg. Ton N.M.
1	2	13	1	14	208	551	4	26	364
2	5	6	1	8½	216	572	8	27	378
3	7	19	1	5½	224	593	12	28	392
4	10	12	1	7	232	614	16	29	406
5	13	5	1	8½	240	636	0	30	420
6	15	18	1	10½	248	657	4	31	434
7	18	11	1	12½	256	678	8	32	448
8	21	4	1	14	264	699	12	33	462
16	42	8	2	28	272	720	16	34	476
24	63	12	3	42	280	742	0	35	490
32	84	16	4	56	288	763	4	36	504
40	106	0	5	70	296	784	8	37	518
48	127	4	6	84	304	805	12	38	532
56	148	8	7	98	312	826	16	39	546
64	169	12	8	112	320	848	0	40	560
72	190	16	9	126	328	869	4	41	574
80	212	0	10	140	336	890	8	42	588
88	233	4	11	154	344	911	12	43	602
96	254	8	12	168	352	932	16	44	616
104	275	12	13	182	360	954	0	45	630
112	296	16	14	196	368	975	4	46	644
120	318	0	15	210	376	996	8	47	658
128	339	4	16	224	384	1017	12	48	672
136	360	8	17	238	392	1038	16	49	686
144	381	12	18	252	400	1060	0	50	700
152	402	16	19	266	408	1081	4	51	714
160	424	0	20	280	416	1102	8	52	728
168	445	4	21	294	424	1123	12	53	742
176	466	8	22	308	432	1144	16	54	756
184	487	12	23	322	440	1166	0	55	770
192	508	16	24	336	448	1187	4	56	784
200	530	0	25	350	456	1208	8	57	798

For vessels from

56 to 100 tons Add half a keel to the above calculations.

100 to 300 - Adopt the figures in the table.

300 to 400 - Subtract half keel.

400 to 800 - Subtract one to three keels, according to tonnage.

In case of ships regulated by the new register, 1855, a reduction of from 10 to
11 ½ cent. must be made from the above calculations.

[MARWOOD.

TABLE No. V.

THE PROPORTIONATE RATES OF FREIGHT ON COAL.

FROM 10s. TO 60s. $\frac{1}{2}$ TON OF 20 CWT., AND FROM £10 12s. TO £63 12s. $\frac{1}{2}$ KEEL OF 21 $\frac{1}{2}$ TONS.

Per Ton.			Per Keel.			Per Ton.			Per Keel.		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
0	10	0	10	12	0 0	1	11	6	33	7	9 6
0	10	6	11	2	7 2	1	12	0	33	18	4 8
0	11	0	11	13	2 4	1	12	6	34	9	0 0
0	11	6	12	3	9 6	1	13	0	34	19	7 2
0	12	0	12	14	4 8	1	13	6	35	10	2 4
0	12	6	13	5	0 0	1	14	0	36	0	9 6
0	13	0	13	15	7 2	1	14	6	36	11	4 8
0	13	6	14	6	2 4	1	15	0	37	2	0 0
0	14	0	14	16	9 6	1	15	6	37	12	7 2
0	14	6	15	7	4 8	1	16	0	38	3	2 4
0	15	0	15	18	0 0	1	16	6	38	13	9 6
0	15	6	16	8	7 2	1	17	0	39	4	4 8
0	16	0	16	19	2 4	1	17	6	39	15	0 0
0	16	6	17	9	9 6	1	18	0	40	5	7 2
0	17	0	18	0	4 8	1	18	6	40	16	2 4
0	17	6	18	11	0 0	1	19	0	41	6	9 6
0	18	0	19	1	7 2	1	19	6	41	17	4 8
0	18	6	19	12	2 4	2	0	0	42	8	0 0
0	19	0	20	2	9 6	2	0	6	42	18	7 2
0	19	6	20	13	4 8	2	1	0	43	9	2 4
1	0	0	21	4	0 0	2	1	6	43	19	9 6
1	0	6	21	14	7 2	2	2	0	44	10	4 8
1	1	0	22	5	2 4	2	2	6	45	1	0 0
1	1	6	22	15	9 6	2	3	0	45	11	7 2
1	2	0	23	6	4 8	2	3	6	46	2	2 4
1	2	6	23	17	0 0	2	4	0	46	12	9 6
1	3	0	24	7	7 2	2	4	6	47	3	4 8
1	3	6	24	18	2 8	2	5	0	47	14	0 0
1	4	0	25	8	9 6	2	5	6	48	4	7 2
1	4	6	25	19	4 8	2	6	0	48	15	2 4
1	5	0	26	10	0 0	2	6	6	49	5	9 6
1	5	6	27	0	7 2	2	7	0	49	16	4 8
1	6	0	27	11	2 4	2	7	6	50	7	0 0
1	6	6	28	1	9 6	2	8	0	50	17	7 2
1	7	0	28	12	4 8	2	8	6	51	8	2 4
1	7	6	29	3	0 0	2	9	0	51	19	9 6
1	8	0	29	13	7 2	2	9	6	52	9	4 8
1	8	6	30	4	2 4	2	10	0	53	0	0 0
1	9	0	30	14	9 6	2	12	6	55	13	0 0
1	9	6	31	5	4 8	2	15	0	58	6	0 0
1	10	0	31	16	0 0	2	17	6	60	19	0 0
1	10	6	32	6	7 2	3	0	0	63	12	0 0
1	11	0	32	17	2 4						

TABLE No. VI.

CANAL TONNAGE—CALEDONIAN CANAL.

BARREL BULK, of all articles not otherwise rated, is rated at 5 cubic feet, excepting when the said measure shall exceed $2\frac{1}{2}$ cwt., in which case $2\frac{1}{2}$ cwt. is to be rated a barrel in bulk.

EIGHT BARRELS bulk or 40 cubic feet one ton.

SMALL PACKAGE not measuring $1\frac{1}{2}$ cubic feet, or not weighing 28 lbs., is reckoned as a quarter of a barrel bulk.

EMPTY CASES or boxes are reckoned at one-eighth of their capacity for gauge measure, but when returned full, if belonging to the same owners, are entitled to a drawback of the dues paid on shipment.

TIMBER: load of oak, ash, elm, beech, birch, or other hard wood, 40 cubic feet; pine, larch, or fir timber, 50 cubic feet.

SLAUGHTERED ANIMALS: the toll is a quarter less than that for live stock.

It has been held that when a ship with cargo from the North Sea to the Irish Sea, or *vice versa*, has passed through this canal, the dues on the cargo fall on the consignee unless there is any express stipulation to the contrary. See the article Caledonian Canal.

Crinan Canal.

Barley	$5\frac{1}{2}$ quarters.	Lime	10 bolls.
Bear or bigg	6 "	" slacked	15 "
Firs, foreign & home in logs or rafts ...}	50 cub. ft.	Malt	15 bushels.
Flour	16 bolls.	Marble	12 cub. ft.
Freestones, grind- stones, &c.}	16 cub. ft.	Meal	16 bolls.
Granite & whin mill- stones	14 "	Oats	7 quarters.
Hardwood	40 "	Slates	800 sizeable.
Herrings	8 barrels.	Tar	8 barrels.
		Wheat, rye, peas, beans, and tares. }	5 quarters.

Gloucester and Berkeley Canal.

MARBLE 14 cubic feet; **OYSTERS** 10 bushels; **TIMBER**, same as Caledonian Canal.

Forth and Clyde Canal.

A ton of **STONE** 14 cubic feet.

FRENCH RATES OF FREIGHT.

The standard for dead-weight in France is the ton of 1,000 kilogrammes. The English ton of 20 cwt., 2,240 lbs., weighs exactly 1,015 kilogrammes.

Tonnage Scale.

Coal is taken at	1,000 kilo	Rice, in bags	1,000 kilo
Sugar, in bags	1,000 "	" in casks	900 "
" refined	900 "	Indigo, in cases	700 "
Tobacco, hhds (Kentucky) ..	700 "	Hemp	400 "
" " (Virginia) ..	800 "	Manilla hemp	600 "
Saltpetre	1,000 "		

TABLE No. VII.

BALTIC AND ARCHANGEL RATES OF FREIGHT.

ASHES, to pay 2-3rds the freight of clean hemp, on the gross weight.

BRISTLES & tann'd HIDES, 2-3rds freight of clean hemp $\frac{2}{3}$ ton of 44 poods gr.

BEE'S WAX (in mate), 2-3rds freight of clean hemp, $\frac{2}{3}$ ton of 63 poods, gr.

BEE'S WAX (in casks), same freight as clean hemp, $\frac{2}{3}$ ton of 63 poods, gr.

FLAX; in all cases same freight as hemp.

FEATHERS, same freight as Codilla hemp, $\frac{2}{3}$ ton of 44 poods, gr.

GRAIN—Wheat, 97 imp. quarters equal to 10 tons of clean hemp.

Pease, Beans,* and tares, 10 $\frac{1}{2}$ cent. more than freight of wheat.

Rye $7\frac{1}{2}$ $\frac{1}{2}$ cent., Linseed 10, Barley 15, Oats 22 $\frac{1}{2}$ less than freight of wheat.

Sowing Linseed, 12 barrels in casks, 24 in bulk, equal to 1 ton of Rhine hemp.

HARE SKINS, same freight as clean hemp, $\frac{2}{3}$ ton of 3,500 skins.

HEMP+ (from Petersburg), outshot 1-8th, half-clean 1-4th, Codilla one half more than freight of clean hemp.

HEMP+ (Riga), outshot 1-8th, pass 1-4th, Codilla one-half more than freight of Rhine hemp—Polish and Rhine hemp on same footing.

HIDES, dried, 3-8ths more than freight of clean hemp, $\frac{2}{3}$ ton, gr.

HIDES, wet or salted, 2-3rds freight of clean hemp, $\frac{2}{3}$ ton, gr.

HORSE HAIR, manufactured, double freight clean hemp, $\frac{2}{3}$ ton 44 poods, gr.

HORSE MANES, 1-4th more than freight of clean hemp, $\frac{2}{3}$ ton of 44 poods, gr.

HORSE TAILS, same freight as clean hemp, $\frac{2}{3}$ ton of 44 poods, gr.

ISINGLASS (bales), same freight as clean hemp, $\frac{2}{3}$ ton of 44 poods, gr.

* Egyptian should be the same as wheat.

+ Outshot should be 1-10th, half clean 3-10ths, Codilla 7-10ths, wool compressed 9-10ths more than clean hemp; wool uncompressed 125 $\frac{1}{2}$ cent. more, or 2 $\frac{1}{2}$ times rate of clean hemp, all $\frac{2}{3}$ ton of 20 cwt. English.

ADDENDA.—WHEAT from the Black Sea to pay $7\frac{1}{2}$ $\frac{1}{2}$ cent. more than the rate in the tables.

LINSEED from the Black Sea to pay 5 $\frac{1}{2}$ cent. more than the rates in the tables.

ALL GRAIN in mats to pay $7\frac{1}{2}$ per cent. more than in bulk.

ALL GRAIN in linen bags to pay 5 per cent. more than in bulk.

MATS, exceeding the proportion of 5 tons of 400 double or 500 single mats to every 100 tons register, to pay 20 $\frac{1}{2}$ cent. more than the rate in the tables, to the extent of one-fourth of the cargo. Any larger proportion to be subject to a special agreement.

WAINSCOT LOGS, shipped as cargo, to pay 30 $\frac{1}{2}$ cent. more freight than for fir timber, per load of 50 cubic feet, Custom-house calliper measure.

BROKEN STOWAGE. A fathom of 4 feet lathwood to pay freight equal to 1 load fir timber; deal ends two-thirds. Freight of deals, staves, and other broken stowage subject to a special agreement.

ISINGLASS (casks), 1-4th more than freight clean hemp, $\frac{2}{3}$ ton 44 poods gr.

LINENS, 80 pieces Flema, 90 raveducks, 120 ditto drillings, 80 ditto narrow, 1 ell, 40 do. broad, 2 ells, sheeting; 60 do. sail-cloth; 6,000 Archeans broad diaper linens or crash; 8,000 ditto Archeans narrow linen diaper huckabacks equal to 2-3rds of a ton of clean hemp.

MATS (from Archangel), 5 $\frac{1}{2}$ cent. less than the freight of hemp, for any quantity not exceeding 1-6th of the ship's cargo, reckoning 400 pieces double and 500 pieces single to a ton.

PITCH AND TAR; 100 barrels equal to 97 quarters of wheat, imperial measure.

TALLOW: 2-3rds freight of clean hemp, on the gross weight.

WOOD not to be considered as coming under the denomination of stowage goods.

Deals; + 120 pieces Petersburg standard equal to 3 loads of timber.

Wainscot Logs, 1-3rd more than freight of fir timber, $\frac{2}{3}$ load of 50 cub. ft., Custom-house calliper measure.

Half Logs for broken stowage, 2-3rds freight of whole logs.

Round Masts, $\frac{1}{2}$ 83 feet, girt measure, equal to 1 load fir timber of 50 feet, Custom-house calliper measure.

Staves (as cargo), 1 mille of running pipe equal to 20 loads of fir timber.

Deal Ends (for broken stowage), 2-3rds the freight of deals.

Lathwood (for broken stowage), 1 fathom of 4 feet equal to 1 load of timber.

WOOL, double freight of clean hemp, $\frac{2}{3}$ ton of 63 poods, gr.

* 13 $\frac{1}{2}$ $\frac{1}{2}$ cent. out of proportion.

+ Deals 10 $\frac{1}{2}$ cent. more wood than 3 loads timber, besides extra dimensions and number of pieces

† Girt measure abolished; the true content taken by calliper, which is in favour of the ship, viz., multiply the diameter by itself in inches, and that product by length in feet; divide by 183 for cubic content, Custom-house measure. (Diameter in inches, to be taken at the middle of the mast.)

TABLE No. VIII.
NEW SCALE OF PROPORTIONATE FREIGHTS.

ALL PER TON OF 20 CWT. GROSS.

Merino & Span. Wool.		Other Wool.		Tallow.		Wheat.		Linseed and Rapeseed.		Barley.	
s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
72	10 80	57	3 60	20	10 20	15	0	16	0 60	17	6 60
75	8 96	59	2 52	21	6 54	15	6	16	7 02	18	1 62
77	9 12	61	1 44	22	2 88	16	0	17	1 44	18	8 64
80	2 28	63	0 36	22	11 22	16	6	17	7 86	19	3 66
82	7 44	64	11 28	23	7 56	17	0	18	2 28	19	10 68
85	0 60	66	10 20	24	3 90	17	6	18	8 70	20	5 70
87	5 76	68	9 12	25	0 24	18	0	19	3 12	21	0 72
89	10 92	70	8 04	25	8 58	18	6	19	9 54	21	7 74
92	4 08	72	6 96	26	4 92	19	0	20	3 96	22	2 76
94	9 24	74	5 88	27	1 26	19	6	20	10 38	22	9 78
97	2 40	76	4 80	27	9 60	20	0	21	4 80	23	4 80
99	7 56	78	3 72	28	5 94	20	6	21	11 22	23	11 82
102	0 72	80	2 64	29	2 28	21	0	22	5 64	24	6 84
104	5 88	82	1 56	29	10 62	21	6	23	0 06	25	1 86
106	11 04	84	0 48	30	6 96	22	0	23	6 48	25	8 88
109	4 20	85	11 40	31	8 30	22	6	24	0 90	26	3 90
111	9 36	87	10 32	31	11 64	23	0	24	7 32	26	10 92
114	2 52	89	9 24	32	7 98	23	6	25	1 74	27	5 94
116	7 68	91	8 16	33	4 32	24	0	25	8 16	28	0 96
119	0 84	93	7 08	34	0 66	24	6	26	2 58	28	7 98
121	6 00	95	6 00	34	9 00	25	0	26	9 00	29	3 00
123	11 16	97	4 92	35	5 34	25	6	27	3 42	29	10 02
126	4 32	99	3 84	36	1 68	26	0	27	9 84	30	5 04
128	9 48	101	2 76	36	10 02	26	6	28	4 26	31	0 06
131	2 64	103	1 68	37	6 36	27	0	28	10 68	31	7 08
133	7 80	105	0 60	38	2 70	27	6	29	5 10	32	2 10
136	0 96	106	11 52	38	11 04	28	0	29	11 52	32	9 12
138	6 12	108	10 44	39	7 38	28	6	30	5 94	33	4 14
140	11 28	110	9 36	40	3 72	29	0	31	0 96	33	11 16
143	4 44	112	8 28	41	0 06	29	6	31	6 78	34	6 18
145	9 60	114	7 20	41	8 40	30	0	32	1 20	35	1 20
157	11 40	124	1 80	45	2 10	32	6	34	9 30	38	0 30
206	6 60	162	4 20	59	0 90	42	6	45	5 70	49	8 70
255	1 80	200	6 60	72	11 70	52	6	56	2 10	61	5 10
303	9 00	238	9 00	86	10 50	62	6	66	10 50	73	1 50
315	10 80	248	3 60	90	4 20	65	0	69	6 60	76	0 60
340	2 40	267	4 80	97	3 60	70	0	74	10 80	81	10 80
352	4 20	276	11 40	100	9 30	72	6	77	6 90	84	9 90
364	6 00	286	6 00	104	5 00	75	0	80	3 00	87	9 00

The equivalent expression of these proportions by weight would be, to say the same rate of freight for,

2,240 lbs. Wheat, Indian corn, &c.
2,185½ lbs. Oats or rye,
2,093½ lbs. Linseed or rapeseed,
1,914½ lbs. Barley,
1,836 lbs. Cotton seed,

1,635 lbs. Oats.
1,611½ lbs. Tallow,
461 lbs. Wool, merinos or Spanish,
586½ lbs. Wool, other sorts.

TABLE No. IX.

RELATIVE RATES OF FREIGHT.

Per ton 20 cwt.	Per quarter 480 lbs.	Per ton 20 cwt.	Per quarter 480 lbs.	Per ton 20 cwt.	Per quarter 480 lbs.
<i>s.</i>	<i>s. d.</i>	<i>s.</i>	<i>s. d.</i>	<i>s.</i>	<i>s. d.</i>
5	1 0 $\frac{1}{2}$	24	5 1 $\frac{1}{2}$	43	9 2 $\frac{1}{2}$
6	1 3 $\frac{1}{2}$	25	5 4 $\frac{1}{2}$	44	9 5 $\frac{1}{2}$
7	1 6	26	5 6 $\frac{1}{2}$	45	9 7 $\frac{1}{2}$
8	1 8 $\frac{1}{2}$	27	5 9 $\frac{1}{2}$	46	9 10 $\frac{1}{2}$
9	1 11 $\frac{1}{2}$	28	6 0	47	10 0 $\frac{1}{2}$
10	2 1 $\frac{1}{2}$	29	6 2 $\frac{1}{2}$	48	10 3 $\frac{1}{2}$
11	2 4 $\frac{1}{2}$	30	6 5 $\frac{1}{2}$	49	10 6
12	2 6 $\frac{1}{2}$	31	6 7 $\frac{1}{2}$	50	10 8 $\frac{1}{2}$
13	2 9 $\frac{1}{2}$	32	6 10 $\frac{1}{2}$	51	10 11 $\frac{1}{2}$
14	3 0	33	7 0 $\frac{1}{2}$	52	11 1 $\frac{1}{2}$
15	3 2 $\frac{1}{2}$	34	7 3 $\frac{1}{2}$	53	11 4 $\frac{1}{2}$
16	3 5 $\frac{1}{2}$	35	7 6	54	11 6 $\frac{1}{2}$
17	3 7 $\frac{1}{2}$	36	7 8 $\frac{1}{2}$	55	11 9 $\frac{1}{2}$
18	3 10 $\frac{1}{2}$	37	7 11 $\frac{1}{2}$	56	12 0
19	4 0 $\frac{1}{2}$	38	8 1 $\frac{1}{2}$	57	12 2 $\frac{1}{2}$
20	4 3 $\frac{1}{2}$	39	8 4 $\frac{1}{2}$	58	12 5 $\frac{1}{2}$
21	4 6	40	8 6 $\frac{1}{2}$	59	12 7 $\frac{1}{2}$
22	4 8 $\frac{1}{2}$	41	8 9 $\frac{1}{2}$	60	12 10 $\frac{1}{2}$
23	4 11 $\frac{1}{2}$	42	9 0		

RUSSIAN CHETWERTS.

RUSSIAN CHETWERTS REDUCED TO IMPERIAL QUARTERS				IMPERIAL QUARTERS REDUCED TO RUSSIAN CHETWERTS.			
Chet.	Qrs.	Chet.	Qrs.	Qrs.	Chet.	Qrs.	Chet.
1	0.72	80	57.72	1	1.39	80	110.85
2	1.44	90	64.94	2	2.77	90	124.70
3	2.16	100	72.15	3	4.16	100	138.56
4	2.89	200	144.31	4	5.54	200	277.12
5	3.61	300	216.46	5	6.93	300	415.68
6	4.33	400	288.62	6	8.31	400	554.24
7	5.05	500	360.77	7	9.70	500	692.80
8	5.77	600	432.92	8	11.08	600	831.36
9	6.49	700	505.08	9	12.47	700	969.92
10	7.22	800	577.23	10	13.86	800	1108.48
20	14.43	900	649.39	20	27.71	900	1247.04
30	21.65	1000	721.54	30	41.57	1000	1385.60
40	28.86	2000	1443.08	40	55.42	2000	2771.20
50	36.08	3000	2164.62	50	69.28	3000	4156.80
60	43.29	4000	2886.16	60	83.14	4000	5542.40
70	50.51	5000	3607.70	70	96.99	5000	6928.00

TABLE No. X.
PROPORTIONATE GRAIN FREIGHT TABLE.

Wheat ¢ quarter.		PEAS, BEANS, and TARES, 10 ¢ cent. more		RYE, 7½ ¢ cent. less.		LINSEED, 10 ¢ cent. less.		BARLEY, 15 ¢ cent. less.		OATS, 22½ ¢ cent. less.	
s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
2	0	2	2½	1	10½	1	9½	1	8½	1	6½
2	3	2	5 ⁷ / ₁₀	2	0½	2	0 ⁷ / ₁₀	1	10½	1	8½
2	6	2	9	2	3½	2	3	2	1½	1	11½
2	9	3	0 ⁷ / ₁₀	2	6½	2	5 ⁷ / ₁₀	2	4 ⁷ / ₁₀	2	1½
3	0	3	3½	2	9 ⁷ / ₁₀	2	8½	2	6½	2	3 ⁷ / ₁₀
3	3	3	6 ⁷ / ₁₀	3	0 ⁷ / ₁₀	2	11 ⁷ / ₁₀	2	9 ⁷ / ₁₀	2	6 ⁷ / ₁₀
3	6	3	10½	3	2½	3	1½	2	11 ⁷ / ₁₀	2	8½
3	9	4	1½	3	5½	3	4½	3	2½	2	10½
4	0	4	4½	3	8½	3	7½	3	4½	3	1½
4	3	4	8 ⁷ / ₁₀	3	11 ⁷ / ₁₀	3	9 ⁷ / ₁₀	3	7 ⁷ / ₁₀	3	3½
4	6	4	11½	4	1½	4	0½	3	9 ⁷ / ₁₀	3	5½
4	9	5	2 ⁷ / ₁₀	4	4½	4	3 ⁷ / ₁₀	4	0 ⁷ / ₁₀	3	8 ⁷ / ₁₀
5	0	5	6	4	7½	4	6	4	3	3	10½
5	3	5	9 ⁷ / ₁₀	4	10½	4	8 ⁷ / ₁₀	4	5½	4	0½
5	6	6	0½	5	1 ⁷ / ₁₀	4	11½	4	8 ⁷ / ₁₀	4	3 ⁷ / ₁₀
5	9	6	3 ⁷ / ₁₀	5	3½	5	2 ⁷ / ₁₀	4	10½	4	5½
6	0	6	7½	5	6½	5	4½	5	1½	4	7½
6	3	6	10½	5	9½	5	7½	5	3½	4	10½
6	6	7	1½	6	0 ⁷ / ₁₀	5	10½	5	6 ⁷ / ₁₀	5	0 ⁷ / ₁₀
6	9	7	5 ⁷ / ₁₀	6	2½	6	0 ⁷ / ₁₀	5	8½	5	2½
7	0	7	8½	6	5 ⁷ / ₁₀	6	3½	5	11½	5	5 ⁷ / ₁₀
7	3	7	11 ⁷ / ₁₀	6	8½	6	6 ⁷ / ₁₀	6	1½	5	7½
7	6	8	3	6	11½	6	9	6	4½	5	9½
7	9	8	6 ⁷ / ₁₀	7	2 ⁷ / ₁₀	6	11 ⁷ / ₁₀	6	7 ⁷ / ₁₀	6	0 ⁷ / ₁₀
8	0	8	9½	7	4½	7	3½	6	9½	6	2½
8	3	9	0 ⁷ / ₁₀	7	7½	7	5 ⁷ / ₁₀	7	0 ⁷ / ₁₀	6	4½
8	6	9	4½	7	10 ⁷ / ₁₀	7	7½	7	2 ⁷ / ₁₀	6	7 ⁷ / ₁₀
8	9	9	7½	8	1½	7	10½	7	5½	6	9½
9	0	9	10½	8	3 ⁷ / ₁₀	8	1½	7	7½	6	11 ⁷ / ₁₀
9	3	10	2 ⁷ / ₁₀	8	6½	8	3 ⁷ / ₁₀	7	10 ⁷ / ₁₀	7	2 ⁷ / ₁₀
9	6	10	5½	8	9 ⁷ / ₁₀	8	6½	8	0 ⁷ / ₁₀	7	4 ⁷ / ₁₀
9	9	10	8 ⁷ / ₁₀	9	0 ⁷ / ₁₀	8	9 ⁷ / ₁₀	8	3 ⁷ / ₁₀	7	6½
10	0	11	0	9	3	9	0	8	6	7	9
10	3	11	3 ⁷ / ₁₀	9	5½	9	2 ⁷ / ₁₀	8	8½	7	11½
10	6	11	6½	9	8½	9	5½	8	11 ⁷ / ₁₀	8	1½
10	9	11	9 ⁷ / ₁₀	9	11½	9	8 ⁷ / ₁₀	9	1½	8	3½
11	0	12	1½	10	2 ⁷ / ₁₀	9	10½	9	4½	8	6 ⁷ / ₁₀
11	3	12	4½	10	4½	10	1½	9	6½	8	8½
11	6	12	7½	10	7½	10	4½	9	9 ⁷ / ₁₀	8	10½
11	9	12	11 ⁷ / ₁₀	10	10½	10	6 ⁷ / ₁₀	9	11½	9	1½
12	0	13	2½	11	1½	10	9½	10	2½	9	3½

TABLE No. XI.
COMPARATIVE RATES OF FREIGHT.

BLACK SEA, &c.

NEW SCALE 1863*		OLD SCALE, LONDON BALTIC RATES.											
Wheat ⌘ ton.		Tallow ⌘ ton.	Wheat ⌘ qr.	Rye ⌘ qr.	Seed ⌘ qr.	Barley, ⌘ qr.	Beans, ⌘ qr.						
s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
18	0-53	25	0	3	10-39	3	6-91	3	5-75	3	3-43	4	3-03
21	7-84	30	0	4	7-67	4	3-49	4	2-10	3	11-32	5	1-23
25	3-10	35	0	5	4-95	5	0-07	4	10-45	4	7-20	5	11-44
27	0-70	37	6	5	9-58	5	4-36	5	2-62	4	11-14	6	4-54
28	10-45	40	0	6	2-23	5	8-66	5	6-80	5	3-09	6	9-64
30	8-06	42	6	6	6-87	6	0-95	5	10-97	5	7-03	7	2-75
32	5-66	45	0	6	11-50	6	5-24	6	3-15	5	10-97	7	7-85
34	3-32	47	6	7	4-14	6	9-52	6	7-33	6	2-92	8	0-95
36	0-98	50	0	7	8-78	7	1-82	6	11-50	6	6-86	8	6-06
37	10-62	52	6	8	1-42	7	6-11	7	3-68	6	10-80	8	11-16
39	8-28	55	0	8	6-06	7	10-40	7	7-85	7	2-74	9	4-26
41	5-93	57	6	8	10-70	8	2-69	8	0-03	7	6-69	9	9-37
43	3-58	60	0	9	3-34	8	6-99	8	4-20	7	10-63	10	2-47
45	1-24	62	6	9	7-98	8	11-28	8	8-38	8	2-58	10	7-57
46	10-89	65	0	10	0-62	9	3-56	9	0-55	8	6-52	11	0-68
48	8-54	67	6	10	5-26	9	7-86	9	4-73	8	10-47	11	5-78
50	6-20	70	0	10	9-90	10	0-15	9	8-90	9	2-41	11	10-88
52	3-85	72	6	11	2-54	10	4-44	10	1-08	9	6-35	12	3-99
54	1-46	75	0	11	7-17	10	8-73	10	5-25	9	10-29	12	9-09

* Indian corn, beans (except Sicilian), tares, lentils, peas, and millet seed, same freight	s.	d.
as wheat; say, per ton	20	0-00
Rye and dari, to pay... 2½ ⌘ cent. more or	20	6-00
Linseed and rapeseed 7	21	4-80
Barley	23	4-80
Cotton seed	24	4-80
Oats	27	4-80
Tallow	27	9-60
Wool, merino & Spanish 386	97	2-40
Wool, other sorts	76	4-80

Unexpressed rates may easily be ascertained by combining two of those indicated, as 16s. and 15s. 6d. for 31s. 6d.; double 20s. for 40s.; &c.

A Russian CHETWERT of corn is equal to 5·77 imperial bushels, English; hence 100 chetwerts=72·12 imperial quarters. A Pood weighs 36 lbs. avoirdupois. In fixing freight for England, a ton is 63 poods of hemp, flax, tallow, iron, copper, and ashes; 44 poods of bristles, isinglass, leather, and wax; 5 dozen deals, 3,500 hare skins, 8 chetwerts of wheat or linseed, and 60 pieces of sail cloth.

TABLE No. XII.

BLACK SEA RATES OF FREIGHT.

Rates of Freight adapted to the Black Sea Trade, calculated according to the London Baltic Printed Rates.

Tallow ♣ ton.	Wheat ♣ qr.	Linseed ♣ qr. 10 ♣ ct. less than wheat.	Peas, Beans and Tares, ♣ qr. 10 ♣ ct. more	Rye, ♣ qr. 7½ ♣ ct. less.	Barley, ♣ qr. 15 ♣ ct. less.	Oats, ♣ qr. 22½ ♣ ct. less.	Wool ♣ ton 63 poods
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
80 0	4 7-670	4 2-108	5 1-237	4 3-494	3 11-819	3 7-144	90 0
32 6	5 0-809	4 6-278	5 6-340	4 7-786	4 3-262	3 10-739	97 6
55 0	5 4-948	4 10-453	5 11-443	5 0-077	4 7-206	4 2-335	105 0
37 6	5 9-587	5 2-628	6 4-546	5 4-368	4 11-149	4 5-980	112 6
40 0	6 2-226	5 6-804	6 9-649	5 8-659	5 3-092	4 5-525	120 0
42 6	6 6-865	5 10-979	7 2-752	6 0-951	5 7-036	5 1-121	127 6
45 0	6 11-505	6 3-154	7 7-855	6 5-242	5 10-979	5 4-716	135 0
47 6	7 4-144	6 7-329	8 0-958	6 9-533	6 2-922	5 8-311	142 6
50 0	7 8-783	6 11-505	8 6-061	7 1-824	6 6-865	5 11-907	150 0
52 6	8 1-422	7 3-680	8 11-164	7 6-115	6 10-809	6 3-502	157 6
55 0	8 6-061	7 7-855	9 4-268	7 10-407	7 2-752	6 7-097	165 0
57 6	8 10-701	8 0-030	9 9-371	8 2-698	7 6-695	6 10-693	172 6
60 0	9 3-340	8 4-206	10 2-474	8 6-989	7 10-639	7 2-288	180 0
62 6	9 7-979	8 8-381	10 7-577	8 11-280	8 2-581	7 5-884	187 6
65 0	10 0-618	9 0-556	11 0-680	9 3-572	8 6-525	7 9-479	195 0
67 6	10 5-257	9 4-731	11 5-783	9 7-863	8 10-469	8 1-074	202 6
70 0	10 8-396	9 8-907	11 10-886	10 0-154	9 2-412	8 4-670	210 0
72 6	11 2-536	10 1-082	12 3-989	10 4-445	9 6-355	8 8-265	217 6
75 0	11 7-175	10 5-257	12 9-092	10 8-737	9 10-298	8 11-860	225 0
77 6	11 11-814	10 9-432	13 2-195	11 1-028	10 2-242	9 3-466	232 6
80 0	12 4-453	11 1-608	13 7-298	11 5-319	10 6-185	9 7-061	240 0
82 6	12 9-092	11 5-583	14 0-401	11 9-610	10 10-128	9 10-646	247 6
85 0	13 1-731	11 9-958	14 5-504	12 1-901	11 2-071	10 2-241	255 0
87 6	13 6-370	12 2-233	14 10-647	12 6-192	11 6-014	10 5-836	262 6
90 0	13 11-009	12 6-809	15 3-710	12 10-488	11 9-957	10 8-432	270 0
92 6	14 3-648	12 10-284	15 8-813	13 2-774	12 1-901	11 1-027	277 6
95 0	14 8-287	13 2-459	16 1-917	13 7-066	12 5-844	11 4-622	285 0
97 6	15 0-927	13 6-834	16 7-020	13 11-357	12 9-787	11 8-218	292 6
100 0	15 5-566	13 11-010	17 0-123	14 3-648	13 1-731	11 11-813	300 0
102 6	15 10-205	14 3-185	17 5-226	14 7-939	13 5-674	12 4-409	307 6
105 0	16 2-844	14 7-860	17 10-329	15 0-231	13 9-617	12 7-004	315 0
107 6	16 7-483	14 11-335	18 3-432	15 4-532	14 1-561	12 10-599	322 6
110 0	17 0-122	15 3-511	18 8-585	15 8-813	14 5-504	13 2-195	330 0
112 6	17 4-762	15 7-886	19 1-638	16 1-104	14 9-447	13 5-793	337 6
115 0	17 9-401	16 0-061	19 6-741	16 5-396	15 1-390	13 9-385	345 0
117 6	18 2-040	16 4-236	19 11-844	16 9-687	15 5-334	14 0-981	352 6
120 0	18 6-679	16 8-412	20 4-945	17 2-378	15 9-277	14 4-576	360 0

A Russian chetwert of corn is equal to 5·77 imperial bushels, English; hence 100 chetwerts=72·12 imperial quarters. A pood weighs 36 lbs. avoirdupois. In fixing freight for England, a ton is 63 poods of hemp, flax, tallow, iron, copper, and ashes; 44 poods of bristles, isinglass, leather, and wax; 5 dozen deals, 3,500 hare skins, 8 chetwerts of wheat or linseed, and 60 pieces of sail cloth.

TABLE No. XIII.

TABLE showing the Number of RUSSIAN POODS contained in any Number of Tons from One to One Hundred and Ninety.

63 POODS TO A TON.										
Tons 1			2	3	4	5	6	7	8	9
		63	126	189	252	315	378	441	504	567
10	630	693	756	819	882	945	1008	1071	1134	1197
20	1260	1323	1386	1449	1512	1575	1638	1701	1764	1827
30	1890	1953	2016	2079	2142	2205	2268	2331	2394	2457
40	2520	2583	2646	2709	2772	2835	2898	2961	3024	3087
50	3150	3213	3276	3339	3402	3465	3528	3591	3654	3717
60	3780	3843	3906	3969	4032	4095	4158	4221	4284	4347
70	4410	4473	4536	4599	4662	4725	4788	4851	4914	4977
80	5040	5103	5166	5229	5292	5355	5418	5481	5544	5607
90	5670	5733	5796	5859	5922	5985	6048	6111	6174	6237
100	6300	6363	6426	6489	6552	6615	6678	6741	6804	6867
110	6930	6993	7056	7119	7182	7245	7308	7371	7434	7497
120	7560	7623	7686	7749	7812	7875	7938	8001	8064	8127
130	8190	8253	8316	8379	8442	8505	8568	8631	8694	8757
140	8820	8883	8946	9009	9072	9135	9198	9261	9324	9387
150	9450	9513	9576	9639	9702	9765	9828	9891	9954	10017
160	10080	10143	10206	10269	10332	10395	10458	10521	10584	10647
170	10710	10773	10836	10899	10962	11025	11088	11151	11214	11277
180	11340	11403	11466	11529	11592	11655	11718	11781	11844	11907
190	11970	12033	12096	12159	12222	12285	12348	12411	12474	12537
44 POODS TO A TON.										
		44	88	132	176	220	264	308	352	396
10	440	484	528	572	616	660	704	748	792	836
20	880	924	968	1012	1056	1100	1144	1188	1232	1276
30	1320	1364	1408	1452	1496	1540	1584	1628	1672	1716
40	1760	1804	1848	1892	1936	1980	2024	2068	2112	2156
50	2200	2244	2288	2332	2376	2420	2464	2508	2552	2596
60	2640	2684	2728	2772	2816	2860	2904	2948	2992	3036
70	3080	3124	3168	3212	3256	3300	3344	3388	3432	3476
80	3520	3564	3608	3652	3696	3740	3784	3828	3872	3916
90	3960	4004	4048	4092	4136	4180	4224	4268	4312	4356
100	4400	4444	4488	4532	4576	4620	4664	4708	4752	4796
110	4840	4884	4928	4972	5016	5060	5104	5148	5192	5236
120	5280	5324	5368	5412	5456	5500	5544	5588	5632	5676
130	5720	5764	5808	5852	5896	5940	5984	6028	6072	6116
140	6160	6204	6248	6292	6336	6380	6424	6468	6512	6556
150	6600	6644	6688	6732	6776	6820	6864	6908	6952	6996
160	7040	7084	7128	7172	7216	7260	7304	7348	7392	7436
170	7480	7524	7568	7612	7656	7700	7744	7788	7832	7876
180	7920	7964	8008	8052	8096	8140	8184	8228	8272	8316
190	8360	8404	8448	8492	8536	8580	8624	8668	8712	8756

Hemp, flax, tallow, iron, copper, and ashes, are freighted 63 poods to a ton.

Bristles, isinglass, leather, and wax are freighted 44 poods to a ton.

A ton of deals is 5 dozen; hare skins, 3,500: wheat or linseed, 8 chetwerts; and sail cloth, 60 pieces.

TABLE No. XIV.

LONDON AND MEDITERRANEAN PROPORTIONATE RATES
OF FREIGHT IN PRACTICE.

Tallow (casks).	Wheat or Maize.	Beans, Peas, and Tares.	Seed, Linseed, Rapeseed.	Rye.	Barley.	Oats.	Flour.		Oil or Wine (casks).
							Barrels.	Bags.	
							Ton 20 cwt.	PER IMPERIAL QUARTER.						Per barrel.	Ton 20 cwt.	Ton 252 gal.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
6 8	1 0	1 1½	0 10½	0 11½	0 10½	0 9½	0 6	5 0	7 6
8 4	1 3	1 4½	1 1½	1 1½	1 0½	0 11½	0 7½	6 3	9 4
10 0	1 6	1 7½	1 4½	1 4½	1 3½	1 2	0 9	7 6	11 3
11 8	1 9	1 11½	1 6½	1 7½	1 5½	1 4½	0 10½	8 9	13 2
13 4	2 0	2 2½	1 9½	1 10½	1 8½	1 6½	1 0	10 0	15 0
15 0	2 3	2 5½	2 0½	2 0½	1 11	1 9	1 1½	11 3	16 10
16 8	2 6	2 9	2 3	2 3½	2 1½	1 11½	1 3	12 6	18 9
18 4	2 9	3 0½	2 5½	2 6½	2 4	2 1½	1 4½	13 9	20 7
20 0	3 0	3 3½	2 8½	2 9½	2 6½	2 3½	1 6	15 0	22 6
21 8	3 3	3 6½	2 11½	3 0	2 9½	2 6½	1 7½	16 3	23 4
23 4	3 6	3 10½	3 1½	3 2½	2 11½	2 8½	1 9	17 6	26 3
25 0	3 9	4 1½	3 4½	3 5½	3 2½	2 11	1 10½	18 9	28 1
26 8	4 0	4 4½	3 7½	3 8½	3 4½	3 1½	2 0	20 0	30 0
28 4	4 3	4 8½	3 9½	3 11½	3 7½	3 3½	2 1½	21 3	31 10
30 0	4 6	4 11½	4 0½	4 2	3 10	3 6	2 3	22 6	33 9
31 8	4 9	5 2½	4 3½	4 4½	4 0½	3 8½	2 4½	23 9	35 7
33 4	5 0	5 6	4 6	4 7½	4 3	3 10½	2 6	25 0	37 6
35 0	5 3	5 9½	4 8½	4 10½	4 5½	4 1	2 7½	26 3	39 4
36 8	5 6	6 0½	4 11½	5 1	4 8½	4 3½	2 9	27 6	41 3
38 4	5 9	6 3½	5 2½	5 3½	4 10½	4 5½	2 10½	28 9	43 2
40 0	6 0	6 7½	5 4½	5 6½	5 1½	4 7½	3 0	30 0	45 0
41 8	6 3	6 10½	5 7½	5 9½	5 3½	4 10½	3 1½	31 3	46 10
43 4	6 6	7 1½	5 10½	6 0	5 6½	5 0½	3 3	32 6	48 9
45 0	6 9	7 5½	6 0½	6 3	5 9	5 3	3 4½	33 9	50 7
46 8	7 0	7 8½	6 3½	6 5½	5 11½	5 5½	3 6	35 0	52 6
48 4	7 3	7 11½	6 6½	6 8½	6 2	5 7½	3 7½	36 3	54 4
50 0	7 6	8 3	6 9	6 11½	6 4½	5 9½	3 9	37 6	56 3
51 8	7 9	8 6½	6 11½	7 2	6 7½	6 0	3 10½	38 9	58 2
53 4	8 0	8 9½	7 2½	7 4½	6 9½	6 2½	4 0	40 0	60 0
55 0	8 3	9 0½	7 5½	7 7½	7 0½	6 4½	4 1½	41 3	61 10
56 8	8 6	9 4½	7 7½	7 10½	7 2½	6 7	4 3	42 6	63 9
58 4	8 9	9 7½	7 10½	8 1½	7 5½	6 9½	4 4½	43 9	65 7
60 0	9 0	9 10½	8 1½	8 3½	7 7½	6 11½	4 6	45 0	67 6
61 8	9 3	10 2½	8 3½	8 6½	7 10½	7 2	4 7½	46 3	69 4
63 4	9 6	10 5½	8 6½	8 9½	8 0½	7 4½	4 9	47 6	71 3
65 0	9 9	10 8½	8 9½	9 0½	8 3½	7 6½	4 10½	48 9	73 2
66 8	10 0	11 0	9 0	9 3	8 6	7 9	5 0	50 0	75 0
68 4	10 3	11 3½	9 2½	9 5½	8 8½	7 11½	5 1½	51 3	76 10
70 0	10 6	11 6½	9 5½	9 8½	8 11½	8 1½	5 3	52 6	78 9
71 8	10 9	11 9½	9 8½	9 11½	9 1½	8 4	5 4½	53 9	80 7
73 4	11 0	12 1½	9 10½	10 2½	9 4½	8 6½	5 6	55 0	82 6
75 0	11 3	12 4½	10 1½	10 5	9 6½	8 8½	5 7½	56 3	84 4
76 8	11 6	12 7½	10 4½	10 7½	9 9½	8 11	5 9	57 6	86 3
78 4	11 9	12 11½	10 6½	10 10½	10 0	9 1½	5 10½	58 9	88 2
80 0	12 0	13 2½	10 9½	11 1½	10 2½	9 3½	6 0	60 0	90 0
86 8	13 0	14 4	11 8	11 10	11 0½	10 0½	6 6	65 0	97 6
93 4	14 0	15 6	12 7	12 9	11 10½	10 10½	7 0	70 0	105 0
100 0	15 0	16 8	13 6	14 0	12 9	11 9	7 6	75 0	112 6

TABLE No. XIV.—CONTINUED.

LONDON AND MEDITERRANEAN PROPORTIONATE RATES
OF FREIGHT IN PRACTICE.

Tallow (casks).	Wheat or Maize.	Madder Ground (casks).	Oil Cakes (bulk).	Shumac (bags).	Valonia (bulk).	Bark of Oak.	Cork Wood.	Bones (bulk).	Sulphur Blissed, Emery Stone Borwood.
Ton 20 cwt.	Per quarter.	PER TON OF 20 CWT.							
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
6 8	1 0	7 10	4 10	5 6	6 3	9 9	30 0	8 0	4 8
8 4	1 3	9 9	6 2	6 9	7 10	11 6	35 0	10 0	5 9
10 0	1 6	11 8	7 3	8 3	9 4	14 9	40 0	12 0	6 9
11 8	1 9	13 7	8 7	9 6	10 10	16 3	45 0	14 0	7 10
13 4	2 0	15 6	9 8	11 0	12 6	19 0	50 0	16 0	8 11
15 0	2 3	17 5	11 0	12 4	14 0	21 3	55 0	18 0	10 0
16 8	2 6	19 4	12 1	13 9	15 7	23 6	60 0	20 0	11 1
18 4	2 9	21 3	13 5	15 0	17 2	26 3	65 0	22 0	12 2
20 0	3 0	23 2	14 6	16 6	18 9	28 6	70 0	24 0	13 3
21 8	3 3	25 1	15 9	17 10	20 4	31 3	75 0	26 0	14 4
23 4	3 6	27 0	16 10	19 3	22 0	33 6	80 0	28 0	15 5
25 0	3 9	28 11	18 3	20 8	23 6	36 3	85 0	30 0	16 6
26 8	4 0	30 10	19 4	22 0	25 0	38 6	90 0	32 0	17 7
28 4	4 3	32 9	20 8	23 5	26 7	41 3	95 0	34 0	18 8
30 0	4 6	34 8	21 9	24 10	28 2	42 9	100 0	36 0	19 9
31 8	4 9	36 7	22 10	26 2	29 9	46 0	105 0	38 0	20 10
33 4	5 0	38 6	24 0	27 6	31 3	48 3	110 0	40 0	21 11
35 0	5 3	40 5	25 3	28 10	32 10	51 0	115 0	42 0	23 0
36 9	5 6	42 4	26 6	30 2	34 4	53 6	120 0	44 0	24 1
38 4	5 9	44 3	27 9	31 7	36 10	55 10	125 0	46 0	25 2
40 0	6 0	46 2	29 0	33 0	37 6	58 6	130 0	48 0	26 3
41 8	6 3	48 1	30 2	34 2	39 0	61 0	135 0	50 0	27 4
43 4	6 6	50 0	31 3	35 3	40 7	63 6	140 0	52 0	28 5
45 0	6 9	51 11	32 6	36 4	42 2	65 10	145 0	54 0	29 6
46 8	7 0	53 10	33 9	37 6	43 9	68 6	150 0	56 0	30 7
48 4	7 3	55 9	35 0	39 4	45 3	70 10	155 0	58 0	31 8
50 0	7 6	57 8	36 3	41 3	46 10	73 6	160 0	60 0	32 9
51 8	7 9	59 7	37 6	43 2	48 6	75 9	165 0	62 0	33 10
53 4	8 0	61 6	38 9	45 0	50 0	78 6	170 0	64 0	35 0
55 0	8 3	63 5	39 10	46 6	51 7	80 10	175 0	66 0	36 1
56 8	8 6	65 4	41 0	48 0	53 2	83 3	180 0	68 0	37 2
58 4	8 9	67 3	42 3	49 6	54 9	86 3	185 0	70 0	38 3
60 0	9 0	69 2	43 6	51 0	56 3	88 6	190 0	72 0	39 4
61 8	9 3	71 1	44 9	52 6	57 10	91 3	195 0	74 0	40 5
63 4	9 6	73 0	45 10	54 0	59 4	93 6	200 0	76 0	41 6
65 0	9 9	74 11	47 3	55 6	60 10	96 3	205 0	78 0	42 7
66 8	10 0	76 10	48 4	57 0	62 6	98 6	210 0	80 0	43 8
68 4	10 3	78 9	49 6	58 4	64 0	101 3	215 0	82 0	44 9
70 0	10 6	80 8	50 8	59 9	65 8	104 6	220 0	84 0	45 10
71 8	10 9	82 7	52 0	61 1	67 2	106 3	225 0	86 0	46 11
73 4	11 0	84 6	53 3	62 6	68 9	108 5	230 0	88 0	48 0
75 0	11 3	86 5	54 6	63 10	70 3	110 0	235 0	90 0	49 1
76 8	11 6	88 4	55 9	65 3	71 10	113 5	240 0	92 0	50 2
78 4	11 9	90 3	57 0	66 7	73 5	116 0	245 0	94 0	51 3
80 0	12 0	92 2	58 6	68 0	75 0	118 9	250 0	96 0	52 4
86 8	13 0	100 8	65 0	74 0	81 3	128 0	270 0	104 0	57 0
93 4	14 0	108 6	72 9	80 0	87 6	138 3	290 0	112 0	61 8
100 0	15 0	116 4	80 0	86 0	93 9	148 0	310 0	120 0	66 6

TABLE No. XIV.—CONTINUED.

LONDON AND MEDITERRANEAN PROPORTIONATE RATES
OF FREIGHT IN PRACTICE.

Tallow (casks).	Wheat or Malze.	Hemp or Flax (clean).	Wool (bales).	Cotton (loose Egyptian bales).		DRY.		Fruit.		GREEN.		Lead Copper. Alkalies, Salt, &c.
						Raisins, Currants.		Oranges Lemons				
						Per ton. 20 cwt. net.		Per case.		Per ton.		
Ton 20 cwt.	Per quarter.	Per ton of 20 cwt.				Per lb.						Ton 20 cwt.
s. d.	s. d.	s. d.	s. d.	s.	d. f.	s. d.	s. d.	s. d.	s.	s. d.	s. d.	s. d.
6 8	1 0	10 6	18 9	20	0 0½	6 8	6 8	0 8	12	4 9		
8 4	1 3	12 9	23 0	25	0 0½	7 0	6 10	0 10½	15	5 10		
10 0	1 6	15 0	28 6	30	0 0½	8 6	8 3	1 0	18	6 11		
11 8	1 9	17 6	33 6	35	0 0½	10 9	10 6	1 1½	21	8 0		
13 4	2 0	20 3	38 4	40	0 0½	12 6	12 4	1 3½	24	9 2		
15 0	2 3	22 7	43 6	45	0 0½	14 0	13 10	1 5½	27	10 3		
16 8	2 6	24 9	48 6	50	0 1½	15 9	15 7	1 7	30	11 4		
18 4	2 9	27 7	53 6	55	0 1½	17 9	17 6	1 8½	33	12 6		
20 0	3 0	29 9	58 6	60	0 1½	19 6	19 0	1 10½	36	13 7		
21 8	3 3	32 6	63 6	65	0 1½	21 0	20 8	2 0½	39	14 8		
23 4	3 6	34 9	68 6	70	0 1½	22 9	22 4	2 2	42	15 9		
25 0	3 9	37 6	73 6	75	0 1½	24 6	23 10	2 3½	45	16 10		
26 8	4 0	39 9	78 6	80	0 1½	26 3	25 4	2 5½	48	18 0		
28 4	4 3	42 6	83 6	85	0 1½	28 0	27 0	2 7½	51	19 1		
30 0	4 6	44 0	88 6	90	0 1½	29 9	28 6	2 9	54	20 2		
31 8	4 9	47 4	93 6	95	0 2½	31 10	30 8	2 10½	57	21 3		
33 4	5 0	49 7	98 6	100	0 2½	33 0	31 10	3 0½	60	22 4		
35 0	5 3	52 2	103 6	105	0 2½	34 10	33 6	3 2½	63	23 6		
36 8	5 6	54 9	108 6	110	0 2½	36 9	35 0	3 4	66	24 7		
38 4	5 9	57 2	113 6	115	0 2½	38 6	36 6	3 5½	69	25 8		
40 0	6 0	59 9	118 6	120	0 2½	40 3	38 0	3 7½	72	26 9		
41 8	6 3	62 3	123 6	125	0 2½	42 6	39 6	3 9½	75	27 10		
43 4	6 6	64 9	128 6	130	0 2½	44 8	41 3	3 11½	78	28 11		
45 0	6 9	67 2	133 6	135	0 2½	46 0	43 0	4 0½	81	30 0		
46 8	7 0	69 9	138 6	140	0 3	47 9	44 9	4 2½	84	31 2		
48 4	7 3	72 2	143 6	145	0 3½	49 6	46 6	4 4½	87	32 3		
50 0	7 6	74 9	148 6	150	0 3½	51 3	48 3	4 6	90	33 4		
51 8	7 9	77 1	153 6	155	0 3½	53 0	50 0	4 8½	93	34 5		
53 4	8 0	79 9	158 6	160	0 3½	54 9	51 9	4 9½	96	35 6		
55 0	8 3	82 2	163 6	165	0 3½	56 5	53 6	4 11	99	36 8		
56 8	8 6	84 7	168 6	170	0 3½	58 2	55 3	5 0½	102	37 9		
58 4	8 9	87 6	173 6	175	0 3½	59 11	57 0	5 2½	105	38 10		
60 0	9 0	89 9	178 6	180	0 3½	61 8	58 9	5 4	108	40 0		
61 8	9 3	92 6	183 6	185	0 3½	63 5	60 6	5 5½	111	41 1		
63 4	9 6	94 9	188 6	190	1 0½	65 2	62 3	5 7½	114	42 2		
65 0	9 9	97 6	193 6	195	1 0½	66 11	64 9	5 9	117	43 3		
66 8	10 0	99 9	198 6	200	1 0½	68 9	66 6	5 10½	120	44 4		
68 4	10 3	102 6	203 6	205	1 0½	70 6	68 3	6 0½	123	45 6		
70 0	10 6	105 9	208 6	210	1 0½	72 3	70 0	6 2½	126	46 7		
71 8	10 9	107 6	213 6	215	1 0½	74 0	71 9	6 3½	129	47 8		
73 4	11 0	109 8	218 6	220	1 0½	75 9	73 7	6 5½	132	48 9		
75 0	11 3	112 3	223 6	225	1 0½	77 6	75 3	6 7½	135	49 10		
76 8	11 6	114 8	228 6	230	1 0½	79 3	77 9	6 9	138	51 0		
78 4	11 9	117 4	233 6	235	1 1½	81 0	79 6	6 10½	141	52 1		
80 0	12 0	120 0	238 6	240	1 1½	82 9	81 3	7 0½	144	53 3		
86 8	13 0	130 0	258 6	260	1 1½	90 0	89 0	7 7	156	58 0		
93 4	14 0	140 0	278 6	280	1 2	97 6	96 6	8 2	168	62 9		
100 0	15 0	150 0	298 6	300	1 2½	105 0	104 9	8 9	180	67 6		

TABLE No. XV.

LEVANT COMPANY'S RATES.

	£	s.	d.		£	s.	d.			
Agarie	⌔	ton	20	0	0	Olive Oil	⌔ 252 gals.	5	0	0
Almonds			6	0	0	Olibanum	⌔ ton	8	0	0
Aloes			7	0	0	Opium		10	0	0
Alum			4	0	0	Orpiment		7	0	0
Aniseed			6	0	0	Otto of Roses	⌔ lb.	0	4	0
Balustines.....	20	0	0			Pease	⌔ qr.	0	12	0
Barley	⌔	qr.	0	12	0	Pellitory Root	⌔ ton	10	0	0
Beans			0	12	0	Pistacia Nuts		13	0	0
Boxwood.....	⌔	ton	2	0	0	Raisins, in casks ...		4	0	0
Brimstone.....	3	0	0			Raisins, in drums		5	0	0
Camel's Hair ...	12	0	0			Rhubarb		15	0	0
Camphor ...	7	0	0			Rice		4	0	0
Carpets	⌔	100 pks.	1	0	0	Saffron		12	0	0
Cass. Fistula	⌔	ton	14	0	0	Sal Ammoniac.....		6	0	0
Caviar	4	0	0			Salip		6	0	0
Cocculus Indicus	7	0	0			Scammony		12	0	0
Coffee	6	0	0			Seeds, not enumerated ...		6	0	0
Colquintida	20	0	0			Senna		17	0	0
Copper	2	0	0			Shagreen Skins		10	0	0
Cotton Wool.....	13	0	0			Sheep's Wool		9	0	0
Cotton Yarn.....	10	0	0			Silk		14	0	0
Currants	4	0	0			Skins, sheep & goat, ⌔ doz.		0	2	0
Dragon's Blood ..	9	0	0			Soap	⌔ ton	4	0	0
Emery Stone	1	0	0			Sponge		14	0	0
Figs, in drums.....	5	0	0			Tallow		4	0	0
Figs, casks and cases	4	0	0			Terra Umbra		2	0	0
Flax or Hemp	13	0	0			Tobacco		13	0	0
Galls	6	0	0			Turbith		7	0	0
Goat Hair or Wool	12	0	0			Turmeric		12	0	0
Gums	7	0	0			Turpentine ...		7	0	0
Gum Arabic	6	0	0			Valonia, in bags		5	0	0
Hare Skins.....	⌔	100	0	2	0	Valonia, in bulk		4	0	0
Hides, raw	⌔	ton	5	0	0	Wax		5	0	0
Honey	5	0	0			Wheat	⌔ qr.	0	14	0
Linseed	⌔	qr.	0	14	0	Whetstones, casks, ⌔ ton		4	0	0
Madder Roots	⌔	ton	8	0	0	Whetstones	loose	2	0	0
Mohair Yarn	12	0	0			Whisk brooms ...	⌔ args.	2	0	0
Natron	4	0	0			Wine, 252 gallons, ⌔ tun		5	0	0
Nuts, small	⌔	bush.	0	1	8	Wood Ashes		4	0	0
Nux des Bin	⌔	ton	12	0	0	Wormwood		6	0	0
Nux Vomica	12	0	0			Yellow Berries		5	0	0
						Zedoary.....	⌔ ton	7	0	0

TABLE No. XVI.

**PROPORTIONATE RATES OF FREIGHT
FOR LEGHORN,**

In Florentine Soldis (with 5 per cent.) per sac, and shillings and pence
per ton tallow and per quarter.

Per sac, with 5 per cent.	Per ton tallow, in full.		Per quarter. in full.	Per sac, with 5 per cent.	Per ton tallow, in full.		Per quarter, in full.
<i>fl. si.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i> <i>d.</i>	<i>fl. si.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>
20	18	1	2 9'60	50	45 3	7	0'00
21	19	0	2 11'28	51	46 2	7	1'68
22	19	11	3 0'96	52	47 1	7	5'36
23	20	10	3 2'64	53	48 0	7	8'04
24	21	8½	3 4'32	54	48 11	7	6'72
25	22	7½	3 6'00	55	49 9½	7	8'40
26	23	6½	3 7'68	56	50 8	7	10'08
27	24	5½	3 9'36	57	51 7	7	11'76
28	25	4	3 11'04	58	52 6	8	1'44
29	26	3	4 0'72	59	53 5	8	3'12
30	27	2	4 2'40	60	54 4	8	4'80
31	28	1	4 4'08	61	55 3	8	6'48
32	29	0	4 5'76	62	56 1½	8	8'16
33	29	10½	4 7'44	63	57 0	8	9'84
34	30	9½	4 9'12	64	57 11	8	11'52
35	31	8	4 10'80	65	58 10	9	1'20
36	32	7	5 0'48	66	59 9	9	2'88
37	33	6	5 2'16	67	60 8	9	4'56
38	34	5	5 3'84	68	61 7	9	6'24
39	35	3½	5 5'52	69	62 6	9	7'92
40	36	2	5 7'20	70	63 4½	9	9'60
41	37	1	5 8'88	71	64 3	9	11'28
42	38	0	5 10'56	72	65 2	10	0'96
43	38	11	6 0'24	73	66 1	10	2'64
44	39	10	6 1'92	74	67 0	10	4'32
45	40	9	6 3'60	75	67 11	10	6'00
46	41	8	6 5'28	76	68 10	10	7'68
47	42	6¾	6 6'96	77	69 8½	10	9'36
48	43	5½	6 8'64	78	70 7½	10	11'04
49	44	4½	6 10'32	79	71 6	11	0'72

The above calculations are made at the following rates of exchange and proportion of measure :

30 lire florentini of 20 soldis.....	£1 sterling.
288 sacs	72 quarters.
97 quarters	15 tons tallow.

TABLE No. XVII.

**PROPORTIONATE RATES OF FREIGHT
FOR GENOA,**

In Lire Nuovi (with 5 per cent.) per hectolitre, and shillings and pence
per ton tallow and per quarter.

Per hectolitre with 5 per cent.	Per ton tallow, in full.	Per quarter, in full.	Per hectolitre with 5 per cent.	Per ton tallow, in full.	Per quarter, in full.
<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>	<i>l. s. d.</i>
1	15 5 47	2 4 64	4½	71 5 78	11 0 46
1½	17 4 65	2 8 22	4½	73 4 97	11 4 04
1½	19 3 83	2 11 80	4½	75 4 16	11 7 62
1½	21 3 01	3 3 38			
1½	23 2 19	3 6 96	5	77 3 35	11 11 20
1½	25 1 38	3 10 54	5½	79 2 53	12 2 78
1½	27 0 56	4 2 12	5½	81 1 71	12 6 32
1½	28 11 75	4 5 70	5½	83 0 89	12 9 90
			5½	85 0 07	13 1 52
2	30 10 94	4 9 28	5½	86 11 25	13 5 10
2½	32 10 12	5 0 86	5½	88 10 44	13 8 68
2½	34 9 30	5 4 44	5½	90 9 63	14 0 26
2½	36 8 48	5 8 02			
2½	38 7 66	5 11 60	6	92 8 82	14 3 84
2½	40 6 84	6 3 18	6½	94 8 00	14 7 42
2½	42 6 03	6 6 76	6½	96 7 18	14 11 00
2½	44 5 22	6 10 34	6½	98 6 36	15 2 58
			6½	100 5 54	15 6 16
3	46 4 41	7 1 92	6½	102 4 72	15 9 74
3½	48 3 59	7 5 50	6½	104 3 91	16 1 32
3½	50 2 77	7 9 08	6½	106 3 10	16 4 90
3½	52 1 95	8 0 66			
3½	54 1 13	8 4 24	7	108 2 29	16 8 48
3½	56 0 31	8 7 82	7½	110 1 47	16 11 06
3½	57 11 50	8 11 40	7½	112 0 65	17 3 64
3½	59 10 69	9 2 98	7½	113 11 83	17 7 22
			7½	115 11 01	17 10 80
4	61 9 88	9 6 56	7½	117 10 19	18 2 38
4½	63 9 06	9 10 14	7½	119 9 38	18 5 96
4½	65 8 24	10 1 72	7½	121 8 57	18 9 54
4½	67 7 42	10 5 30			
4½	69 6 60	10 8 88	8	123 7 76	19 1 12

The above calculations are made at the following rates of exchange
and proportions of measure :

25 lire mori of 100 centimes	£1 sterling.
205 hectolitres	72 quarters.
97 quarters	15 tons tallow.

TABLE No. XVIII.

**PROPORTIONATE RATES OF FREIGHT
FOR TRIESTE.**

In Kreutzers (with 5 per cent.) per stajo, and shillings and pence per ton
tallow and per quarter.

Per stajo with 5 per cent.	Per ton tallow, in full.		Per quarter, in full.		Per stajo with 5 per cent.	Per ton tallow, in full.		Per quarter, in full.	
<i>Kreutz.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>Kreutz.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
30	23	7½	3	7 85	60	47	3	7	3 70
31	24	5	3	9 31	61	48	0½	7	5 16
32	25	2½	3	10 77	62	48	10	7	6 62
33	26	0	4	0 23	63	49	7½	7	8 08
34	26	9½	4	1 69	64	50	5	7	9 54
35	27	6½	4	3 16	65	51	2½	7	11 00
36	28	4½	4	4 62	66	52	0	8	0 47
37	29	1½	4	6 08	67	52	9	8	1 93
38	29	11	4	7 54	68	53	6½	8	3 39
39	30	8½	4	9 00	69	54	4	8	4 85
40	31	6	4	10 46	70	55	1½	8	6 31
41	32	3½	4	11 93	71	55	11	8	7 77
42	33	1	5	1 39	72	56	8½	8	9 23
43	33	10½	5	2 85	73	57	6	8	10 70
44	34	7½	5	4 31	74	58	3½	9	0 16
45	35	5½	5	5 77	75	59	1	9	1 62
46	36	2½	5	7 23	76	59	10½	9	3 08
47	37	0	5	8 69	77	60	4½	9	4 54
48	37	9½	5	10 16	78	61	5½	9	6 00
49	38	7	5	11 62	79	62	2½	9	7 47
50	39	4½	6	1 08	80	63	0	9	8 93
51	40	2	6	2 54	81	63	9½	9	10 39
52	40	11½	6	4 00	82	64	7	9	11 85
53	41	9	6	5 46	83	65	4½	10	1 32
54	42	6½	6	6 93	84	66	2	10	2 77
55	43	3½	6	8 39	85	66	11½	10	4 24
56	44	1½	6	9 85	86	67	9	10	5 70
57	44	10½	6	11 31	87	68	6½	10	7 16
58	45	8	7	0 77	88	69	3½	10	8 62
59	46	5½	7	2 23	89	70	0	10	10 08

The above calculations are made at the following rates of exchange and proportions of measure :

10 florins of 60 kreutzers £1 sterling.
 250 stajos 72 quarters.
 97 quarters 15 tons tallow.

TABLE No. XIX.

**PROPORTIONATE RATES OF FREIGHT
FOR MARSEILLES.**

In Francs (with 5 per cent.) per charge, and shillings and pence per ton tallow and per quarter.

Per charge with 5 per cent.	Per ton tallow, in full.		Per quarter, in full.	Per charge with 5 per cent.	Per ton tallow, in full.		Per quarter, in full.
<i>francs.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>francs.</i>	<i>s.</i>	<i>d.</i>
2	19	7-20	8	0-20	5½	56	4-20
2½	20	9-90	8	2-45	5½	57	6-90
2½	22	0-60	8	4-70	6	58	9-60
2½	23	8-80	8	6-95	6½	60	0-80
2½	24	6-00	8	9-20	6½	61	8-00
2½	25	8-70	8	11-45	6½	62	5-70
2½	26	11-40	4	1-70	6½	63	8-40
2½	28	2-10	4	8-95	6½	64	11-10
					6½	66	1-80
3	29	4-80	4	6-20	6½	67	4-50
3½	30	7-50	4	8-45	7	68	7-20
3½	31	10-20	4	10-70	7½	69	9-90
3½	33	0-90	5	0-95	7½	71	0-60
3½	34	8-60	5	8-20	7½	72	8-80
3½	35	6-30	5	5-45	7½	73	6-00
3½	36	9-00	5	7-70	7½	74	8-70
3½	37	11-70	5	9-95	7½	75	11-40
					7½	77	2-10
4	39	2-40	6	0-20	8	78	4-80
4½	40	5-10	6	2-45	8½	79	7-50
4½	41	7-80	6	4-70	8½	80	10-20
4½	42	10-50	6	6-95	8½	82	0-90
4½	44	1-20	6	9-00	8½	83	8-60
4½	45	8-90	6	11-25	8½	84	6-80
4½	46	6-60	7	1-50	8½	85	9-00
4½	47	9-30	7	8-75	8½	86	11-70
					9	88	2-40
5	49	0-00	7	6-00	9½	89	5-10
5½	50	2-70	7	8-25	9½	90	7-80
5½	51	5-40	7	10-50	9½	98	1-20
5½	52	8-10	8	0-75			
5½	53	10-80	8	8-00			
5½	55	1-50	8	5-25			

The above calculations are made at the following rates of exchange and proportions of measure :

25 francs of 100 centimes.....	£1 sterling.
180 charges	72 quarters.
97 quarters	15 tons tallow.

D

TABLE No. XX.

TONNAGE SCHEDULE IN INDIA.

The left-hand column of each division shows how many Cwt. go to a Ton for Freight ;
the right-hand column the number of Cubic Feet.

Abbreviations—ba bale, bg bags, bk bulk, ca cases, rob robbins, sc screwed.

	Bengal Madras Bombay					Bengal Madras Bombay			
Aloes, bags, cwt.	20	20	-	-	Copra, in robbins	-	-	-	12
boxes	20	20	-	-	Coral, rough (not				
kegs	-	-	16	-	specimens), bag	20	-	20	-
Alum	20	20	20	-	Coriander	-	12	-	-
Annatto cases	-	-	-	50	Cotton, in bales...	-	50	-	50
Aniseed	8	8	-	-	piece goods	-	-	50	-
Apparel	-	50	50	50	Cowries, in bags	20	20	20	-
Arrowroot, cases	-	50	50	50	cases	-	-	-	50
Asafoetida, bags	20	20	-	-	Cubebs	-	-	-	12
boxes	20	20	-	-	Cummin seed, ca.	-	-	-	50
cases	-	-	-	50	Cutch, unsc. bags	17	17	16	-
Barilla	20	20	20	-	Dates, wet	20	20	20	-
Bark, in bags	8	8	-	-	dry	16	16	16	-
Bees' Wax	-	20	-	-	Dholi	20	20	-	-
in cases	-	-	-	50	Dragons' blood, ca.	-	-	-	50
Betel nut	18	18	-	-	Ebony sq. & strait	-	-	-	50
in bags	-	-	-	16	otherwise	-	-	-	20
Black wood, square	-	-	-	-	Elph'nts teeth, bk.	16	16	-	-
straight log	-	-	-	50	cases	-	50	50	50
otherwise	-	-	-	20	bundles	-	-	-	18
Books	-	50	50	50	loose	-	-	-	20
Borax or tincal	20	20	20	-	Fennigarriek seed	-	16	-	-
cases	-	-	50	50	Furniture	-	50	50	50
Brimstone	20	20	-	-	Galingals	-	-	-	12
Bullion, per cent.	-	-	-	-	Galls, in bags	-	-	-	16
Cake-lac, in bags	16	16	-	-	cases	-	-	-	50
Camphor, cases	-	50	50	50	Garlic and onions	12	12	-	-
Cardamoms, rob.	8	8	-	-	Ginger, in bags	12	12	12	-
boxes	-	50	50	50	dry, cases	-	-	50	50
bags	-	-	10	-	Gingelly seed	-	17	-	-
Cassia, all sorts	-	50	50	50	Gram	20	20	20	-
Castor seed	-	-	15	-	Ground nuts shld.	-	-	-	16
Chasum	-	-	-	10	Gums, in cases,	-	-	-	-
China root, bags	11	11	-	-	not enumerated	-	50	-	50
boxes	-	50	50	50	Olibanum, bags	-	18	16	-
Chiretta	-	50	50	-	Gunny bags	-	50	50	-
Cigars	-	50	50	50	cloth	-	50	50	-
Cinnamon, bales	-	-	-	6	Gunjah	-	50	50	-
cases	-	-	-	50	Hartall, in cases	-	-	-	50
Cloves, chests	-	50	50	50	Hemp, sc'd. bales	-	50	50	50
bags or frazils	8	8	10	-	loose or bundles	-	-	-	7
Coal	20	20	20	-	Hides & skins, sc.	-	-	-	-
Cochineal	-	50	50	-	bales, cured	-	50	-	50
Cocoa, bags	-	-	-	12	loose & sm. bun	-	-	-	12
Cocculus Indicus,	-	-	-	-	Hides	-	14	-	-
in bags	-	-	-	16	Hoofs, horn sha-				
Coffee, in cases	-	-	17	50	vings, tips, (all				
bags or frazils	18	18	16	-	kinds)	20	20	16	-
robbins & caaks	16	16	-	-	Horns, Cow or buf-				
Coir yarn & fibre,	-	-	-	-	falo, loose	20	20	16	-
screwed bales	-	-	50	50	Deer, loose	20	16	8	-
bundles or loose	-	-	10	-	Indigo, in cases	-	50	50	50
rope in coils	-	-	-	8	Jackwood	-	-	-	50
Colocynth, cases	-	-	-	50	Jute, in bales	-	50	50	-
Colombo root, bg.	-	-	-	14					

TABLE No. XX.—CONTINUED.

TONNAGE SCHEDULE IN INDIA.

The left-hand column of each division shows how many Cwt. go to a Ton for Freight; the right-hand column the number of Cubic Feet.

Abbreviations—ba bale, bg bags, bk bulk, ca cases, rob Robbins, ss screwed.

Bengal Madras Bombay				Bengal Madras Bombay					
Lee dye, in shells or cases	-	50	- 50	- 50	Safflower, sc. bales cases	-	50	- 50	- 50
Lard	-	50	- 50	-	bags	-	-	- 10	-
Linseed, in bags ..	20	- 18	- 18	-	Sago, in cases ...	-	50	- 50	- 50
Mace, in cases ...	-	50	- 50	- 50	Sal ammoniac, bag ..	15	- 15	- 18	-
Machinery	20	- 20	-	-	boxes or cases ...	-	50	- 50	- 50
Metals	20	- 20	-	-	Saltpetre	20	- 20	- 20	-
Mirabolines	16	- 16	- 16	-	Salt	20	- 20	-	-
Molasses	20	- 20	-	-	Sandal and sapan wood for d'nage ..	20	- 20	- 16	-
Mother O'Pearl in bags	20	- 20	- 20	-	Sarsaparilla	-	-	- 50	-
cheets	20	- 20	-	-	Sealing wax, cases ..	-	50	- 50	- 50
cases	-	-	-	- 50	Seedlac, in cases ...	-	50	- 50	-
Munjeet, ca. or ba. bundles or bags ..	-	50	- 50	- 50	bags	16	- 16	-	-
Musk, in cases ...	-	-	-	- 12	Senna, in bales ...	-	50	- 50	- 50
Mustard or Rape seed	20	- 18	- 17	-	bags	-	-	- 6	-
Nutmegs, cases, cheets or casks ..	-	50	- 50	- 50	Sharks' fins	-	- 16	-	-
Nux vomica, bags ..	16	- 16	- 16	-	Shells, rough, bags ..	20	- 20	- 20	-
cases	-	-	-	- 50	Shellac, in cases ...	-	50	- 50	-
Nuts ground, shell shelled	-	- 12	-	-	bags	16	- 16	-	-
Oats	12	- 12	-	-	Silk Piece Goods ..	-	50	- 50	-
Oils, in cases ...	20	- 20	-	-	Skins	-	50	- 50	-
any kind, casks ..	20	- 210 imp. gal.	-	-	Soap, country, ca. ..	-	50	- 50	- 50
Oil, seeds & khor. ..	-	-	-	- 17	bars	20	- 20	-	-
Opium	2 chest	-	-	2 chest	bags	15	- 15	-	-
Paddy, in bags ...	15	- 15	- 16	-	Stick lac, in cases ..	-	50	- 50	-
Pease	20	- 20	-	-	bags	16	- 16	-	-
Pepper, long	12	- 12	-	-	Sugar, in bags ...	20	- 20	- 20	-
black, Robbins ...	14	- 14	-	-	Talc	20	- 20	- 20	-
bags	-	- 16	- 16	-	Tallow	-	-	-	- 50
Pimento	-	-	- 14	-	cases or casks ...	20	- 20	-	-
Planks and Deals ..	-	50	- 50	-	Tamarind ditto ...	20	- 20	- 18	-
Plumbago, bags ...	-	-	-	- 20	Tapioca	-	50	- 50	-
Poppy seed	20	- 15	-	-	Tea, in chests ...	-	50	- 50	- 50
Putchuck	10	- 10	-	-	Teel seed	20	-	- 17	-
Rattans, in bundles, whangoes, and canes ..	-	-	-	- 16	Timber, round ...	-	40	-	- 40
ground	-	-	-	- 16	Timber, hewn ...	-	50	- 50	-
for dunnage	20	- 20	-	-	Teak, square ...	-	-	-	-
Raw Silk, bales ...	10	- 10	- 10	-	Planks and Poom ..	-	-	-	- 50
cases	-	-	-	- 50	Tobacco, in bales ..	-	50	- 50	- 50
Redwood dunnage ..	20	- 20	- 16	-	Tortoise shells, in chests	-	50	- 50	- 50
Rhea, in bales ...	-	50	- 50	-	Turneris, bags ...	12	- 14	- 13	-
Rhubarb, in cases ..	-	-	-	- 50	Tutenague	-	-	- 20	-
Rice, in bags	20	- 20	- 20	-	Unrated Wood ...	-	-	-	- 14
Roping, in coils ...	-	50	- 50	-	Wheat	20	- 20	- 20	-
Lines & twines in bundles	14	- 14	-	-	Wines and Spirits, casks and cases ..	-	-	-	- 50
Rope, Coir, Coils ..	-	-	-	- 10	Wool, in screwed bales	-	50	- 50	- 50
Rum, in casks ... 2pun 4hhd 210gal	-	-	-	-	Zedoary	-	-	-	- 20
					All other articles, not enumerated, bales or cases...	-	50	- 50	-

TABLE No. XXI.

CALCUTTA CARGOES ON AN AVERAGE SCALE.

(From Capt. SZODWICK'S *Golden Hints*.)

	cub. ft.		cub. ft.
A ton of saltpetre measures...	86	A ton poppyseed measures	
Sugar	89	over	73
Rice	45	Indigo	15 to 16 cwt. 50
14 cwt. hides, which go the		Silk, jute, or chassum 10	50
ton if well screwed, average	45	Hemp weighs	15 „ 48
If badly screwed, sometimes		Lac dye (about)	18 „ 50
near	60	Silk, in bales	10 „ 64
Five bales jute, * which go to the		Silk piece goods, cases 9	50
ton and weigh 15cwt., average	46	Cassia,† in cases	5 „ 50
Sometimes, when badly		Rum, in casks	60
screwed	50	Molasses, in casks, weighs about	
A ton shell lac, 10 to 12 cwt....	50	80 per cent. more than rum	60
Rapeseed or linseed	62		

* Sometimes shipped by measurement; 50 cubic feet, compressed in bales, frequently weigh 17 cwt.

† When Cassia is taken at 10 cwt., the rate of freight should be increased in proportion.

Assuming the rate of freight on SALTPETRE to be £4 per ton, the following table is easily made by the average scale :—

	£	s.	d.		£	s.	d.		£	s.	d.
Saltpetre...	4	0	0	Lac dye ...	5	11	1	Cassia	5	11	1
Hides	5	0	0	Sugar	4	6	8	Rice	5	0	0
Rapeseed .	6	17	9	Jute	5	2	8	Shell lac ...	5	11	1
Chassum...	5	11	1	Indigo	5	11	1	Poppyseed .	8	2	8
Silk, cases .	5	11	1	Hemp	5	6	8	Rum	6	18	4

This scale refers to the space taken by each article more than to its actual weight; but it will assist a master in choosing his cargo, so as to get the best freight ruling. Suppose him about to engage the dead-weight (saltpetre, sugar, or rice), it follows, that if saltpetre be £4 per ton and rice £4 10s., saltpetre is better than rice. After engaging all the dead-weight, which should be not much over two-thirds or three fourths of her new register tonnage, then choose jute or hides, whichever bears the highest rate. Hides are generally preferable; but the master should be previously satisfied that they are well screwed.

A Master who has had great experience says, “in stowing a Calcutta cargo the space occupied by various goods is very different, for instance, a ton of saltpetre, occupies 85 cubic feet, a ton of ginger 80 feet. Suppose £3 per ton for saltpetre, which occupies 85 feet; in order to obtain the same freight for ginger you ought to get £6 17s. 2d. per ton. The following are the respective weights and measurements of some of the Calcutta produce :—

TABLE No. XXI.—CONTINUED.

	cub. ft.		cub. ft.
20 cwt. Sugar measures about	39	20 cwt. Flour measures about	48
20 cwt. Rice	42	20 cwt. Coffee	61
20 cwt. Linseed	56	20 cwt. Turmeric	66
20 cwt. Wheat	44	5 bales Jute	64

Mr. BRIDGELL in his work on *Indian Commerce*, makes the following estimate :—

75 tons Zinc (12 cwt.) weighs 45·00 tons	75 tons Borax (16 cwt.) weighs 60·00 tons
75 tons Hides (14 cwt.) „ 52·50 „	75 tons Cutch (18 cwt.) „ 67·50 „
75 tons Jute (1,600 lbs.) weighs 50·2282 tons.	

A vessel capable of carrying 1,100 tons avoirdupois, having a space in her hold for 71,600 cubic feet might be laden with

797½ tons light freight (797½ × 76)	60,810 feet	} together 71,500 feet.
302½ tons dead weight (302½ × 86)	10,890 feet	

Average the light freight at 76 feet per ton and the dead weight at 86 feet.

Supposing the freight of saltpetre to be £4 5s. per ton and sugar £4 16s., and that a ton of saltpetre measures 35 feet and of Sugar 39 feet, it is of course more advantageous to take sugar. Supposing saltpetre to be £4 and jute £3 15s. per ton of 1,500 lbs.; saltpetre being 35 feet and jute 35½ feet, saltpetre is the more advantageous. Supposing sugar to be £4 10s. 8d. and rice £4 12s. 6d.; sugar being 39 feet and rice 42 feet, sugar is the more advantageous; see also the article ton.

Madras Tonnage.

Coir in bales, Cotton, Gunjah, Hamp, Jute, Munjeet, Senna Leaf, Wool, and Sarsaparilla, are to be measured before shipment, and the measurement to be entered on the face of the bill of lading. The callipers are to take in the rope on one side of the bale, and leave it out on the other. Half inches are to be given and taken alternately. Ten bales per cent. as a maximum, are to be measured, moiety to be chosen by the shipper and moiety by the ship; if disputed, the bales are to be measured by a Surveyor permanently appointed by the Chamber, whose decision to be final; his fee to be five rupees, half to be borne by each party. All other goods to be measured at port of discharge. (*Chamber of Commerce, 1st June, 1854.*)

Bombay Tonnage.

The standard ton for measurement goods is 50 cubic feet. Freight on Oil to be paid on the full gauge of the cask, ascertained at the port of discharge. When freight is payable on weight it is to be on the net weight delivered. (*Chamber of Commerce, Bombay, 6th June, 1856.*)

TABLE No. XXII.

INDIAN WEIGHTS.

Throughout the Bengal Presidency the legal weight is the INDIAN MUN of 40 seers of 80 tolas each. The SEER of 60 tolas is used in Bauleah, Commercecolly, Patna, Rungpore, Santipore, and Soonamokey; 82, in Agra, Cossimbazaar, Furruckabad, Hooghley, Malda, and Patna; 90, in Rungypore; 94, in Agra, and Furruckabad; 96, in Allahabad, Benares, Lucknow, Malda, and Santipore; 108, in Benares; 105, in Benares; and 110, in Furruckabad.

500 bags of goods, each bag 30 seers=	8-88338 tons
500 ditto	25 seers=10-41666 tons
500 ditto	30 seers=12-5 tons

Avoirdupois Weight converted into Indian Muns and Bazaar and Factory Maunds.

16 drams	1 oz.	[chit.
256 „ =	16 „ =	1 lb.=7½ Ind. chittocks=7½ bazaar chit.=8½ fac.
7,168 „ =	448 „ =	28 „ = 1 quarter. [maunds=1½ factory maunds
28,672 „ =	1,792 „ =	112 „ = 4 „ = 1 cwt.=1½ Ind. muns=1¾ bazaar
578,440 „ =	35,840 „ =	2,240 „ = 80 „ = 20 „ = 1 ton=27½ Indian muns=
		27½ bazaar maunds=30 factory maunds
		9 tons=245 Indian muns 11 tons=300 bazaar maunds

Factory Maunds converted into Bazaar Maunds, Indian Muns, and Avoirdupois.

16 chittacks 1 seer	.....	1½ lb.
640 „ =40 „ =	1 fac maund = ½ baz maund = ½ Ind mun=	½ cwt=7½ lb.
11 „ =	10 „	
54 „	=49 „	
80 „	=1 ton	

To convert factory into bazaar maunds, divide the former by 11, and deduct the quotient from it.

Bazaar Maunds converted into Factory Maunds, Indian Muns, and Avoirdupois.

16 chittacks 1 seer	.....	1½ factory seer=2½ lbs.
640 „ =40 „ =	1 baz. maund 1½ fac. maund	½ Ind. mun=82½ lbs.
10 „ =	11 „	
540 „	=539 „	
30 „	=22 cwt.	

To convert bazaar into factory maunds, divide the former by ten, and add the quotient to it.

Tolas converted into Troy Weight.

½ grains troy	1 pie	.....	1 ruttee=	4 dhau
11½ „ =	12 „ =	1 anna	= 1 maaha=	8 „ = 32 „
180 „ =	192 „ =	16 „ = 1 tola	= 12 „ =	96 „ = 384 „

TABLE No. XXII.—CONTINUED.

Troy Weight converted into Tolas and Indian Muns.

24 grains	1 pennyweight								
480 "	= 20	"	= 1 oz.						
5,760 "	= 240	"	= 12	"	= 1 lb.	= 32 talas	= 6	Indian chittacks	
					100	= 3200	"	= 1 Indian mun.	

Indian Muns converted into Bazaar and Factory Maunds and Avoirdupois.

16 chittacks	= 1 seer							2½ lbs.	
640 "	= 40	"	= 1 Ind mun	= 1½	bas maund	= 1½	fac maund	= 82½	lbs.
				539	"	= 540	"		
				49	"			54	"
				245	"				9 tons.

Avoirdupois Weight converted into Madras and Bombay Commercial Weights.

1 dram								½ Madras pagoda	
16 "	=	1 oz.							
256 "	=	16	"	=	1 lb.				
1,792 "	=	112	"	=	7	"		10 Bombay seers	
6,400 "	=	400	"	=	25	"		1 Madras maund	
7,168 "	=	448	"	=	28	"	= 1 quarter	1 Bombay do.	
28,672 "	=	1,792	"	=	112	"	= 4	"	= 1 cwt.
573,440 "	=	35,840	"	=	2,240	"	= 80	"	= 20
								"	= 1 ton
									= 4 Bombay candy
									25
									"
									= 112 Madras candy

Madras Commercial Weights converted into Indian Muns and Avoirdupois.

1 pagoda								2 drams	
10 "	=	1 pollum							
80 "	=	8	"	=	1 seer			10 oz.	
400 "	=	40	"	=	5	"			
3,200 "	=	320	"	=	40	"	= 8	"	= 1 maund
									= 25 lb.
									= 12½ I. seers
64,000 "	=	6,400	"	=	800	"	= 160	"	= 20
								"	= 1 candy
									= 500 lb.
									= 6¼ I. mun
								144	"
								875	"

Bombay Commercial Weights converted into Indian Muns and Avoirdupois.

30 pice	1 seer							7½ lb. avoirdupois	
1,200 "	= 40	"	= 1 Bombay maund	1 quarter				[maunds=7½ fac. maunds	
2,400 "	= 800	"	= 20	"				1 Bombay can=5 cwt.=6½ I. mun=6¼ bz.	
								4 Bombay candy=1 ton= 30 fac. maunds	
								36	"
								= 9	"
								= 245	Ind. muns.

TABLE No. XXIII.

THE PROPORTIONATE RATES OF FREIGHT ON THE

Timber ♣ load of 50 feet.	Round Masts ♣ load.	Deals ♣ Petersburg standard hundred.	Standard Staves ♣ mille.	West India Staves ♣ mille.	Lathwood ♣ fathom.	Sleepers 9 by 10 by 5- ♣ piece.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1 0 0	1 2 9	3 6 0	16 2 2	5 5 0	3 0 0	0 1 3
1 1 0	1 3 11	3 9 4	16 18 4	5 10 3	3 3 0	0 1 4
1 2 0	1 5 0	3 12 7	17 14 5	5 15 6	3 6 0	0 1 5
1 3 0	1 6 2	3 15 11	18 10 6	6 0 9	3 9 0	0 1 5
1 4 0	1 7 4	3 19 2	19 6 7	6 6 0	3 12 0	0 1 6
1 5 0	1 8 5	4 2 6	20 2 9	6 11 3	3 15 0	0 1 7
1 6 0	1 9 7	4 5 9	20 18 10	6 16 6	3 18 0	0 1 8
1 7 0	1 10 8	4 9 1	21 14 11	7 1 9	4 1 0	0 1 8
1 8 0	1 11 10	4 12 5	22 11 0	7 7 0	4 4 0	0 1 9
1 9 0	1 12 11	4 15 8	23 7 2	7 12 3	4 7 0	0 1 10
1 10 0	1 14 1	4 19 0	24 8 3	7 17 6	4 10 0	0 1 10
1 11 0	1 15 3	5 2 4	24 19 5	8 2 9	4 13 0	0 1 11
1 12 0	1 16 5	5 5 7	25 15 6	8 8 0	4 16 0	0 2 0
1 13 0	1 17 6	5 8 11	26 11 7	8 13 3	4 19 0	0 2 1
1 14 0	1 18 8	5 12 2	27 7 9	8 18 6	5 2 0	0 2 2
1 15 0	1 19 10	5 15 6	28 3 10	9 3 9	5 5 0	0 2 2
1 16 0	2 1 0	5 18 10	29 0 0	9 9 0	5 8 0	0 2 3
1 17 0	2 2 1	6 2 1	29 16 1	9 14 3	5 11 0	0 2 4
1 18 0	2 3 3	6 5 5	30 12 3	9 19 6	5 14 0	0 2 5
1 19 0	2 4 5	6 8 8	31 8 4	10 4 9	5 17 0	0 2 5
2 0 0	2 5 6	6 12 0	32 4 5	10 10 0	6 0 0	0 2 6
2 1 0	2 6 8	6 15 4	33 0 7	10 15 3	6 3 0	0 2 7
2 2 0	2 7 9	6 18 7	33 16 8	11 0 6	6 6 0	0 2 8
2 3 0	2 8 10	7 1 11	34 12 9	11 5 9	6 9 0	0 2 8
2 4 0	2 10 0	7 5 2	35 8 11	11 11 0	6 12 0	0 2 9
2 5 0	2 11 2	7 8 6	36 5 0	11 16 3	6 15 0	0 2 10
2 6 0	2 12 4	7 11 10	37 1 2	12 1 6	6 18 0	0 2 11
2 7 0	2 13 6	7 15 1	37 16 5	12 6 9	7 1 0	0 2 11
2 8 0	2 14 7	7 18 5	38 12 6	12 12 0	7 4 0	0 3 0

Remarks.

DEALS.... 1 St. Petersburg standard hundred= 3 $\frac{1}{2}$ loads timber.

STAVES ... 1 mille standard 1,200 pieces=16 $\frac{1}{2}$ "

DITTO..... 1 mille West India 1,200 pieces= 5 $\frac{1}{2}$ "

LATHWOOD 1 fathom of 4 feet long 6 x 6 = 3 "

These articles should pay $\frac{1}{3}$ ds of rates in table, when shipped as broken stowage; but the common, though unjust practice, in open charters, is to apportion the rates for broken stowage as follows:—

DEALS.....	A hundred Petersburg standard twice the rate	} charged for timber per load.
STAVES ...	A mille standard, at six times the rate	
DITTO	A mille West India, at twice the rate	
DITTO	A fathom of lathwood, at the same rate	

As the ship loses freight on deals and staves, owing to the variation in sizes and the loss in stowing so many pieces, besides the loss arising from the greater thickness of the deals and staves than they carry in the specification (a 3-inch deal measuring, on an average, 3 $\frac{1}{2}$ inches, while staves have still greater inequalities), it is evident that these articles are more disadvantageous to the carrier, even at the rates given in the table, than is timber at its rates. The practice is, therefore, in a two-fold degree unjust, and ought to be amended.

TABLE No. XXIII.—CONTINUED.

PRINCIPAL ARTICLES OF EXPORT FROM QUEBEC.

Flour ☞ barrel.	Pork or beef ☞ barrel.	Beef tierce.	Wheat ☞ quarter.	Peas ☞ quarter.	Oats ☞ quarter.	Barley ☞ quarter.	Ashes ☞ ton of 40 feet.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
2 4	2 11	4 1	3 9	4 6	3 0	3 8	0 16 0
2 6	3 1	4 3	4 0	4 3	3 2	3 5	0 16 10
2 7	3 2	4 8	4 2	4 5	3 3	3 7	0 17 7
2 8	3 4	4 8	4 4	4 7	3 5	3 9	0 18 4
2 9	3 5	4 11	4 6	4 10	3 7	3 11	0 19 2
2 11	3 7	5 1	4 8	5 0	3 9	4 1	1 0 0
3 0	3 9	5 4	4 11	5 3	3 10	4 3	1 0 9
3 1	3 10	5 6	5 1	5 5	4 0	4 5	1 1 7
3 3	4 0	5 9	5 3	5 7	4 2	4 7	1 2 4
3 4	4 2	6 0	5 5	5 10	4 4	4 9	1 3 2
3 6	4 4	6 2	5 7	6 0	4 5	4 11	1 4 0
3 7	4 6	6 5	5 10	6 3	4 7	5 0	1 4 9
3 9	4 8	6 8	6 0	6 5	4 9	5 2	1 5 7
3 10	4 9	6 10	6 2	6 7	4 11	5 4	1 6 5
3 11	4 11	7 1	6 5	6 10	5 0	5 6	1 7 2
4 1	5 1	7 3	6 7	7 1	5 2	5 8	1 8 0
4 2	5 3	7 6	6 10	7 3	5 4	5 10	1 8 9
4 4	5 5	7 8	7 0	7 6	5 6	6 0	1 9 7
4 5	5 6	7 11	7 2	7 8	5 7	6 2	1 10 5
4 7	5 8	8 1	7 4	7 10	5 9	6 4	1 11 2
4 8	5 10	8 4	7 7	8 0	5 11	6 6	1 12 0
4 9	6 0	8 6	7 9	8 3	6 1	6 8	1 12 9
4 11	6 2	8 9	8 0	8 5	6 3	6 10	1 13 7
5 0	6 3	8 11	8 2	8 8	6 4	7 0	1 14 5
5 2	6 5	9 2	8 4	8 10	6 6	7 2	1 15 2
5 3	6 7	9 4	8 6	9 1	6 8	7 4	1 16 0
5 4	6 8	9 7	8 9	9 3	6 10	7 6	1 16 9
5 6	6 9	9 9	8 11	9 6	6 11	7 8	1 17 7
5 7	6 11	10 0	9 2	9 8	7 1	7 10	1 18 5

Remarks.

DEALS.—When bright, usually pay 5s. to 10s. per hundred less than their proportionate rate, as struck in the foregoing table, in consequence of the convenience and dispatch afforded by them, as a ship's cargo, and to cover the expense of lighterage to which, by the custom of the port, the shipper is subject in delivering them on board of the ship; the allowance is, of course, not made as respects floated deals, shipped in moulinettes.

WHEAT, &c.—Every description of grain pays higher rates of freight than other goods, in proportion, owing to the expense to which the ship is put for lining, &c., to receive it, and for the risk attending so perishable a cargo. Ample allowance is therefore made in striking the above rates, but the author is far from agreeing to the justice of the scale adopted in New York, in this respect, where wheat pays almost double the rate charged for flour. [The Quebec rules for stowing grain will be found with the article grain.]

FLOUR.—In barrels (like bright deals) is generally taken somewhat under its proportionate rate, owing to the small expense attending its loading as a ship's cargo.

TABLE No. XXIV.

CHINESE EXPORTS.

(Extracted from MORRISON'S Chinese Commercial Guide.)

Approximate Cubic Measurement in feet and decimals, allowing for the packages being matted, with the number of packages in a ton of each description of goods, at 50 cubic feet per ton, as rated in English ships.

CUBICAL CONTENTS.				No. of Packages per ton.	
				bales.	
Raw silk	each box	9 bundles	7-112	7-216	
Ditto	bale	1 pecul	6-471	7 and bales and	
				4-708 feet	
Nankeen blue	box	50 pieces	3-333	15	
Do. Company's long	-	100 -	3-333	15	
Do. Company's short	-	100 -	2-200	25	
Cassia	-	1 -	10-143	4 and 9-432 feet	
Ditto	-	$\frac{1}{2}$ -	6-950	7 and 1-35 feet	
Cassia buds	-	1 -	6-500	7 and $4\frac{1}{2}$ feet	
Rhubarb	-	$\frac{1}{2}$ -	3-333	15 or 8 parcel boxes	
Tortoise-shell	-	1 -	9-000	6 average	
Star aniseed	-	$\frac{1}{2}$ -	4-000	12 $\frac{1}{2}$ or 6 peculs	
Vermilion	-	90 papers	1-000	50	
Musk	-	1 pecul	8-000	6 $\frac{1}{2}$ average	
Camphor and gamboge	-	1 -	4-640	12 and 1-232 feet	
Sweetmeats, box 6 jars	-	—	2 $\frac{1}{2}$	23	
Sweetmeats, box 4 jars	-	—	2	25	
Liche or sugar candy, tubs	-	—	3	16 $\frac{1}{2}$	
				peculs	
China root and turmeric ...	-	—	—	12	
Galangal	-	—	—	18 $\frac{1}{2}$	

Measurement of Boxes of Silk Piece Goods.

pcs.		cub. ft.	No. to tons	pcs.		cub. ft.	No. to tons
25	Handkerchiefs ...	2 $\frac{1}{2}$	21	25	Canton crape	2 $\frac{1}{2}$	20
25	Sarsenet	2 $\frac{1}{2}$	20	50	Shawls	2	25
25	Satin	3 $\frac{1}{2}$	15	50	Pieces Dresses	2	25
25	Nanking crape ..	2 $\frac{1}{2}$	21	25	Do. Lutestring ...	2	25

The following solid contents are calculated at 40 feet per ton, being the measurement as estimated in American ships trading to China.

AVERAGE PER BOX.			ft. dec.	AVERAGE PER BOX.			ft. dec.
Raw Silk, teatlee	-	-	8-57	Cassia buds, in cases of 1 pecul	-	-	4-688
Ditto tayssam	-	-	7-63	Camphor	1	-	4-112
Rhubarb, in cases of 1 pecul	-	-	6-112	Gamboge	1	-	4-286
Ditto	$\frac{1}{2}$	-	3-126	Dragons' blood	1	-	7-432
Vermilion	50 catt.	-	0-272	Palm-leaf fans	-	-	9-886
Aniseed oil	1 pecul	-	5-16	Fire-crackers, half-boxes ...	-	-	3-827
Ditto	$\frac{1}{2}$	-	2-564	Preserves, in cases of 6 jars	-	-	1-791
Cassia oil	$\frac{1}{2}$	-	3-80	Blue Nankeen	-	-	2-692
Ditto	1	-	5-45	Sewing silk	-	-	1-213

TABLE No. XXV.

NEW YORK RATES OF FREIGHT.

OF THE QUANTITY OF GOODS TO COMPOSE A TON.

1,568	Lbs. of Coffee in casks, 1,830 ditto in bags, 1,120 lbs. of Cocoa in casks, 1,307 ditto in bags.
952	Lbs. of Pimento in casks, 1,110 ditto in bags.
8	Barrels of Flour of 196 lbs. each.
6	Barrels of Beef, Pork, Tallow, Pickled Fish, Pitch, Tar, and Turpentine.
20	Cwt. of pig and bar Iron, Potashes, Sugar, Logwood, Fustic, Nicaragua Wood, and all heavy Dye-woods, Rice, Honey, Copper Ore, and all other heavy goods.
16	Cwt. of Coffee, Cocoa, and dried Cod-fish in bulk, and 12 cwt. dried Cod-fish in casks of any size.
6	Cwt. of Ship Bread in casks, 7 cwt. in bags, and 8 cwt. in bulk.
200	Gallons (wine measure), reckoning the full contents of the casks, of Oil, Wine, Brandy, or other kind of liquors.
22	Bushels of Grain*, Peas, or Beans in casks.
36	Bushels of ditto in bulk.
36	Bushels of European Salt, 31 bushels of Salt from West Indies.
29	Bushels of Sea Coal.
40	Feet (cubic measure) of Mahogany, square Timber, Oak Plank, Pine and other boards, Beavers, Firs, Peltry, Bees' Wax, Cotton, Wool, and Bale Goods of all kinds.
1	Hogshead of Tobacco, and 10 cwt. dry Hides.
8	Cwt. China raw silk, 10 cwt. net Bohea, and 8 cwt. green Tea.

* The New York rules for stowing grain will be found with the article grain.

New York Measures and Weights of Different Substances.

	lb. oz.		lb.
Ton water (net) 250 gals.	—	Steel	489-08
Cubic foot do. spec. grav.	62 9	Cast Iron	450-45
Sea-water	64 2		cub. in.
New York harbour water	63 14	Bushel of beans.....	100 63
Cork	15 0	Cord of wood, stowage	128 1,700
Tallow	59 0	A man and his effects	2 to 2½ cwt.
Platina	1,218-75	Average weight of a horse	1,000
Copper	486-75	Average weight of a man	150
Lead ..	709-05		

Weight of a Bushel, United States.

Dry Apples	22 lbs.	Hempseed 45 lbs. Flax	45@46 lbs.
Barley	48 lbs.	Oats	32@36 lbs.
Beans	60@63 lbs.	Onions	43@57 lbs.
Blue grass seed	14 lbs.	Peaches, dry	32 lbs.
Bran	20 lbs.	Potatoes	56@60 lbs.
Coal	80 lbs.	Sweet potatoes.....	50 lbs.
Corn 56 lbs. Corn shell	56 lbs.	Rye	56 lbs.
Corn, unshelled	70 lbs.	Salt, fine 55 lbs., coarse	50 lbs.
Corn in the ear	70 lbs.	Timothy seed	45 lbs.
Corn or cob	70 lbs.	Wheat	60 lbs.
Clover seed	60 lbs.		

TABLE No. XXVI.

BALTIMORE—FREIGHT AND FREIGHTING.

If a vessel is freighted by the ton, and no special agreement is made respecting the proportions at which each article shall be computed, the following shall be the standard of computation, and either parcel deemed equal to a ton, viz. :—

2,240	lbs.	Pig and bar Iron, Lead, Copper, Logwood, Fus-
2,000	—	tic, and other heavy Dye-woods
2,240	lbs. net.	Nicaragua and Braziletto Wood
1,880	—	Sugar and Rice casks
1,600	—	Coffee bags
1,300	—	" casks
1,120	—	Cocoa bags or bulk
1,110	—	" casks
952	—	Pimento bags
800	—	" casks
700	—	Ship Bread bags
1,120	—	" casks
900	—	Dried Hides
1,120	—	Weight green Teas and China raw Silk
1,600	—	" Bohea, and other black Tea
1,800	—	" Virginia Tobacco ... hogsheads
1,000	—	" Kentucky " "
8	barrels	" Maryland " "
6	—	Flour, of 196 lbs. net
7	—	Beef, Pork, and Tallow
200	gallons	Naval Stores and Pickled Fish
22	wine measure	Oil, Wine, Brandy, &c., estimating the full
40	bushels	contents of the cask
40	—	Grain, Peas, Beans, &c. casks
40	—	" bulk
81	—	Salt, Liverpool brown "
80	—	" ground "
80	—	" St. Ubes, Cape Verde, &c. "
80	—	" West India "
40	cubic feet	" Sea Coal "
		Plank, Boards, Timber, Bale Goods, Packages,
		and Boxes.

In estimating the contents in cubic feet of various packages and goods, the following shall be the standard :—

	feet		feet
Flour, a barrel	5	Tobacco, Kentucky, Georgia,	
Rice, a tierce	15	and Carolina, hogshead ..	40
Flax seed, a hogshead	12	Tobacco, Maryland and Ohio	35
Tobacco, Virginia, hogshead...	45	Grain, five bushels, in bulk...	5

In computing boxes of candles and soap, kegs of butter and lard, and hams and bacon, and generally all similar articles, 200 lbs., net weight, shall be considered equal to a barrel of five cubic feet.

TABLE No. XXVII.

BAHIA TONNAGE SCALE.

By order of the Directors of the Bahia Commercial Association (1851) the ton of different Articles of Produce is to be calculated as follows :

NET WEIGHT IN	BAHIA.	ENGLAND.	FRANCE.
	Arrobas.	Cwt. of 112 lbs.	Kilos.
Sugar in cases, boxes, or barrels	79	20	1000
— bags	80½	23	1150
Coffee in barrels	63	18	900
— bags	73½	21	1050
Tobacco leaf in bales	42	12	600
— serons	56	16	800
— rolls	70	20	1000
— mangotes	78½	21	1050
Hides, dry	45	12½	645
— salted	56	16	800
— green	70	20	1000
Cotton, Macoa, or S. Francisco	29	8½	414
— Cachoirs	27	7½	586
Oocoa in bags	56	16	800
Tapioca in barrels	49	14	700
— bags	56	16	800
Jacarandi Logs	80½	23	1150
	Canadas.	Old gal. velhos.	
Rum in pipes	105	210	
Molasses	90	180	
Rice, in bags		28 cwt.	
Rice, in barrels		18 cwt.	
Bones		13 cwt.	
Hoofs		10 cwt.	
Ocoilhos		8 mil.	
Cigars		40 cubic feet.	
Horns, Rio Grande or Buenos Ayres		2 mil.	
Horns, Bahia		8 mil.	
Molasses, in pipes		181 old gallons.	

[PUB. LEDGER, OCT. 17, 1856.]

Bahia Charter-Parties.

It is stated that some forms of charter-party used in the Brazil Trade read "freight to be paid (say 55s.) for the United Kingdom for sugar in bags, or other lawful merchandize in proportion, according to the custom of the port of loading," and that caution should be observed in accepting such forms. In the Bahia district a scale is adopted in which sugar in cases or boxes is made the standard article. This scale appears to be about say 15 per cent. in error if the ship loads three parts of her cargo—cotton.

TABLE No. XXVIII.

CUSTOM OF THE PORT OF RIO GRANDE DO SUL.

The proportional difference on Freight between WET SALTED HIDES and other produce shipped is as follows:

TALLOW, in cases or casks	} The same rate as for wet salted hides, on gross weight delivered.
JERKED BEEF	
TALLOW or GREASE in pipes, $\frac{1}{2}$ -pipes, or $\frac{1}{4}$ -pipes, 10 ¢ cent.	} more than for Wet Salted Hides, on gross weight delivered.
more than for Wet Salted Hides, on gross weight delivered.	
BONE ASH.....	} 12 ¢ cent. less than for Wet Salted Hides.
STONES, loose or in barrels ..	

For Wool in Bales, or Hair in Bags.

When the vessel is entirely loaded with these articles, 100 ¢ cent. more than for Wet Salted Hides.

If loaded with $\frac{1}{4}$ -ths of her cargo with these articles..	75 ¢ cent. ditto.
If loaded with half	50 ¢ cent. ditto.
If loaded with one-fourth	25 ¢ cent. ditto.
If loaded with seven-eighths	15 ¢ cent. ditto.
If loaded with less than seven-eighths.....	Same as for Salted Hides.

For Dry Hides, Hair in Bales, or Hide Outtings.

If loaded with these articles	50 ¢ cent. more than for W. S. Hides.
If loaded with three-fourths of the cargo	40 ¢ cent. ditto.
If loaded with half of the cargo	20 ¢ cent. ditto.
If loaded with quarter of the cargo	Same as for Wet Salted Hides.

In case of ballast being required the vessel has to find the same.

Lay Days do not count on clearing at the Custom-house, or in changing anchorage.

Usual Form of Charter-party.

It is this day mutually agreed between of the good ship or vessel called the of tons register or thereabouts, whereof is at present Master, and now at anchor in the port of and that the said ship being tight, staunch, and strong, and in every way fitted for the voyage, shall with all convenient speed not exceeding what she can reasonably stow and carry above her tackle, apparel, provisions, and furniture, and being so loaded shall therewith proceed to or so near thereto as she may safely get, and there deliver the same on being paid freight at and after the rate of as follows:

Lastages for Freight.

NORWAY. 49 lasts=160 tons English.	than barley, which gets 20 ¢ cent. over oats.
STETTIN. 4,000 lbs.	
LUBECK. 69½ lasts=162 tons reg.	AMSTERDAM. 4,000 lbs. of iron or copper,
DENMARK. 44½ lasts=100 tons English.	2,000 lbs. ballast, 5½ bushels oats.
BREMENHAVEN. 12 barrels herrings, salt,	LISBON. 4 pipes oil or wine, 4 chests
or coal, 10 qr. 0·7 bushels wheat.	sugar, 4,000 lbs. tobacco, 8,600 lbs. of
HAMBURG ship last=8 tons, or 6,000 lbs.,	shumac.
10 lasts 108·8 quarters.	MALAGA. 4 boats or 5 pipes wine or oil,
ROTTERDAM. 8 oxhoids wine, 5 pieces gin,	4 bales orange peel, 5 pipes P. Ximenes
14 barrels herrings, 12 do. pitch, 13 tar,	wine or oil, 10 casks almonds (each
4 casks olive oil, 7 ditto whale, 20 cases	about 380 lbs.), 20 chests lemons and
oranges, 4,000 lbs. rice, 800 lbs. almonds,	oranges, 22 casks almonds, 44 casks
2,000 lbs. wool. For freight the last	raisins (4 arrobas each), 87 half-casks
of wheat is charged 10 ¢ cent. higher	raisins, 50 baskets or 160 jars raisins.

STOWAGE.

Seventh Edition.

1. ACIDS are chemical preparations of a sharp and sour taste, of which the number is very large. The termination of the prefix denotes the strength—*ic* being applied to the stronger, and *ous* to the weaker acids. Unless packed in sand in the hold, all dangerous acids in carboys ought to be stowed on deck, which should be shown on the bill of lading “with liberty to throw overboard for the safety of the ship, if deemed necessary.” Underwriters object to the stowage of dangerous acids in the hold, and an experienced master says—that whether in carboys or in strong bottles packed in cases, they should never be stowed in the hold or ’tween decks, but *always* on deck, with “liberty,” &c. ; see the article dangerous goods. The specific gravity of acetic acids is 1·062, of muriatic 1·200, and of nitric 1·271.

2. AFRICAN NUTS. Ships will not stow more than half to two-thirds of their register tonnage ; see nuts.

3. ALE AND BEER for exportation is what is termed by brewers “higher hopped,” and undergoes a different kind of fermentation than that for home consumption. Ale has been known to keep for two years in India. For southern voyages casks are occasionally spiled with rattan cane cut close, or with porous spiles of red oak, &c. In bottles it should be stowed in the fore part of the ship, if passing into or through the tropics, because the temperature is always cooler there than in the main or after hold. Casks and cases containing bottled ale are often very fragile, and will not bear the pressure of

heavy goods, shippers therefore wish to have them stowed separately; when packed with straw, it is necessary to ascertain that it is perfectly dry, or breakage will ensue. If shipped in frosty weather the bottles are more brittle and liable to breakage. If too brisk when shipped the bottles frequently burst. It often turns sour, so that bill of lading should not be for the beer "in good order and condition," but only for so many *packages* "in good order, &c., said to contain beer," or "state of beer unknown." Ale and beer ought not to be placed near goods of a heating character, such as coal, flour, sugar, &c., as they create additional fermentation, besides which the dust from coal chokes the spiles of casks, and prevents the ale from relieving itself on the voyage. Considerable pillage is sometimes carried on on board ship, and the vigilance of the officers is constantly required when loading and unloading; for stowage see also the articles casks, general cargo, liquids, provisions, and spirits. Messrs. BASS & Co. consider that the proper *season* for shipping ales is from the middle of October to the end of June. The busiest months of that firm are November, December, and March, but their shipments are pretty evenly distributed through November, &c., to May. Messrs. ALLSOPP consider the best season for export from November to April inclusive.

4. **Frost.** The *Shipping Gazette*, when asked whether underwriters were liable for loss arising from the breakage of bottles by frost, answers 9th July, 1856: "being insured 'against the adventures and perils of the seas and all other perils, losses, or misfortunes, that have or shall come to the hurt, detriment, or damage of the said goods, or any part thereof,' the underwriters must be supposed to have been aware of the nature of the risks which they assured, and the effects of those risks upon the cargo insured; they would therefore, be liable to make good the loss, provided it were proved that the cargo had been properly packed and stowed."

5. **Deficiency.** Glasgow Small Debt Court, January, 1859, MARTINE, a brewer, of Haddington, transmitted 47 hhds. of 54 galls. each Indian ale, by rail to Glasgow. As the ship was not at her berth, the ale was stored *pro tempore*, with CAMERON & CO., Commerce-street, who signed a receipt "in good condition." When delivered at the ship's side, one hogshead was stoved and leaking, and another spiled and deficient. Defenders admitted the damage to the former, which had been stoved by their carter, but denied their liability for the spiled cask, and called on the pursuer to prove that they had "sucked the monkey." The pursuer argued that having received the hogshead "in good order," the liability attached to them until they devolved it on others. The sheriff held accordingly, and laid the *onus probandi* on the defenders, whose agent contended that the acknowledged "good order" referred to outward condition, and denied responsibility for the contents, which they had no opportunity to examine. The sheriff did not consider it was for him to provide a remedy. If a store-keeper received a hogshead of ale, he must produce it, and not half a hogshead: he, therefore, decerned against defenders for value of both hogsheads and ale, and expenses.

6. **Varnish.** The Indian Council rejected the *Jeanne Douglas* as unfit to convey beer from London to Bombay because her hold had been painted with some kind of varnish. Court of Exchequer, *BURCHAN v. MILLS*, 2nd July, 1869.

Tonnage, freight, &c. 24 doz. bottled ale or porter, whether 24 cases of 1 doz. each, 8 of 3 doz., or 4 of 6 doz., or 40 cubic feet, go to a ton. ALLSOPP'S ales are packed in cases and casks containing 3, 4, and 6 doz. each; 32 doz. are said to go to a ton. BASS'S ales are always shipped by the *turn* of 4 hhd., 6 bar., or 12 kil.; the weight of these sizes may be taken in round numbers at 6, 4, and 2 cwt.—the hhd. being rather under 6 cwt., and the barrels and kilderkins being rather over 4 and 2 cwt. Irish beer casks are not of the full contents, and contain 52, 32, and 16 gals. respectively; the tonnage is computed at 12 kil., 6 bar., or 4 hhds. to a ton; they are frequently freighted by the cask.

Ale Measure. 4 gills 1 pint; 2 pints 1 quart; 4 quarts 1 gal.; 9 gals. 1 firkin; 2 firkins or 18 gals. 1 kil.; 2 kils. or 36 gals. 1 bar.; 1½ bar., 3 kils., or 54 gals. 1 hhd.; 2 hhds. or 108 gals. 1 butt.

7. **ALKALI** or **KILI**, or **SODA ASH**, is a kind of salt found in the ashes of burnt vegetables. Of these, potash and soda are chiefly used in the manufacture of glass and soap. It is injured by water, and if washed out, will seriously damage every kind of manufactured goods; it should be placed well off from the bilges. At Newcastle it is usually stowed on the ceiling or in the ends, according to the nature of the cargo. Newcastle alkali is packed in casks of 10 cwt. each; 18 tons are taken as being equal to a keel of coal or 850 cubic feet. At Calcutta and Bombay 20 cwt. fossil alkali go to a ton. When wheat is 1s. ½ quarter freight, soda and other alkalis are rated, casks 6s. 0¾d., and bulk 4s. 7½d. ½ ton; Mediterranean 4s. 9d. ½ ton of 20 cwt.; see potash, soda, &c.

8. **ALOES.** Four of the principal sorts are, the Socotrine, from the Island of Socotra; the Hepatic from Arabia; the Cabaline, from Barbadoes; and the Cape aloes, from the Cape of Good Hope and Melinda. Socotrine are packed in cases, goat skins, and bladders; Cape in cases 1 to 5 cwt.; Barbadoes in gourds; and Hepatic in small kegs 1 to 1½ cwt. They should be kept clear of all edibles, &c. The cases ought to be water-tight; although they appear perfect when received at Natal, yet when passing the Line, the heat may cause the contents to leak; aloes are usually stowed as dead-weight under wool. Bengal and Madras ton 20 cwt. net, bags or boxes; Bombay 16 cwt. kegs.

9. **ALUM**, a valuable salt obtained from ores, or from clay or earths containing sulphur, dug out for this purpose; specific gravity 1·714. It is usually packed in casks containing about 6½ cwt. each. Alum is injured by water, and if washed out, having an acid action, will seriously damage all kinds of manufactured goods and metallic

wares ; it may be stowed with soda. From China to India it is shipped in small matted bags slightly tapered at one end, and weighing about 20 catties (30 lbs.) It should, if possible, be stowed in the ends of the ship, and worked up from keelson to deck ; matting and bamboo dunnage, should be carefully placed between the alum and other cargo butting on to it, otherwise damage may ensue, as the alum bags are generally quite rotten when discharged. Bengal, Madras, and Bombay ton 20 cwt.

10. AMBERGRIS is supposed to be a concretion formed in the stomach of the Spermaceti whale, and is usually found on the sea coast of India, Africa, Brazil, Nassau, New Providence, and the Bahamas ; its specific gravity varies from '780 to '926. It is packed in small boxes and in tins containing from 3 ozs. to 10 lbs. Some shippers consider that it should be stowed in the cuddy or cabin. 20 cwt. go to a ton at Bombay.

11. AMMONIACAL LIQUOR—(GAS WATER). About half-past 2 p.m., on the 3rd March, 1870, the dead bodies of a father, mother, and three children, were found in the cabin of the sloop *Sarah*, of Goole. The vessel was taking in gas-water at the British gas-works on the river Hull. The mother called out of the cabin and said her eldest daughter was dead ; the father went below, and a quarter of an hour later the whole family were found dead in the cabin, suffocated by the fumes from the gas-water.

12. AMMUNITION. All lights and fires are extinguished when receiving or discharging gunpowder. In loading ammunition, use shot and empty shell for ballast, and keep them as much as possible in the body of the ship. A government officer recommends shot lockers to be carried up amidship ; powder, live shell, and rockets in magazines properly constructed. Judgment is required as to quantity, for being generally in the bottom it tends to make a ship labour and strain. The Admiralty restrict the freight to two-thirds of the register tonnage.

13. When ships-of-war receive or discharge **powder**, all fires and lights are ordered to be extinguished, and tobacco smoking is prohibited. When from necessity, powder or live shells are being discharged from, or received on board a steamer with her fires lighted in the engine-room, the vessel conveying or receiving the same is to be placed to windward of the funnel ; and in case of the steamer swinging, the hatches of the vessel are to be put on and covered with tarpaulins, until she can be removed to a safe and proper position.

14. In a merchant ship's magazine there have been found cases of powder, weights and scales, trunks, iron hoops, &c., all together, to the manifest danger of every one. It is usual to build the magazine abaft the lazarette, although the great danger from fire is here; how often is it that provisions of every description are stored there, with a puncheon of spirit in the midst, notwithstanding that the daily consumption is drawn off by candle light? Magazines should be placed so that in the event of fire the powder can be got on deck ready for throwing overboard; the crew will always have more confidence when they know it is not under them.

**WEIGHT OF ADMIRALTY SHELL, &c, IN POUNDS,
as issued for Service.**

Admiralty Shell.	10-in.	8-in.	32-pr.	24-pr.
Weight of empty shell	77½	46	24	15½
Powder to fill shell for bursting	6½	2½	1½	1
Shell when filled with powder	84	48½	25½	16½
Box to pack shell in	15	11	6	5
When packed for issue ...	99	59½	31½	21½

Another authority says 10-in. shell boxes are 12, 8-in. are 10, and 6-in. are 8-in. square. The bulk of 100 10-in. shell boxes is about 87, 8-in. 64, and 6-in. 38 cubic feet.

15. To ascertain in the Royal Navy if there is any dampness in the powder magazine, the gunner is instructed to place in it a piece of sponge which has been dipped in a solution of salt and water, and afterwards dried; should it become heavier the magazine is damp. Wet or damp **cartridges** are never returned to the same packages whence they are taken, nor re-packed with dry packages, but stowed by themselves. After exercising, the shot of any loaded gun is to be drawn and the powder fired or started overboard. Cartridges which have been in the guns are never returned to the magazine, as they have been found to contain detonating powder from broken tubes left in the guns at previous exercises. Gun metal adzes, when struck against the copper hoops of powder barrels are always to be used with a wooden setter, as otherwise strong sparks of fire may be produced. Powder cases or barrels are never to be repaired with iron or copper nails.

16. The Horse Guards, 14th December, 1855, strictly enjoin the avoidance of iron hoops or iron nails in the heading up of cartridge barrels, or the presence of iron or grit among the percussion caps,

cartridges, or loose powder, if any should accumulate from broken cartridges taken out of the men's pouches; also the use of iron nails in fastening on cards of address.

ARMSTRONG GUNS AND SHOT.

Length of 110 lbs. shot 12'3, shell 18'75, and segment shell 14'3 inches.

Nature of gun.	Weight.	Diam. of bore.	Length.	No. of grooves.	Twist of rifling.	Common shell.	Bursting charge.	Segment shell.	Bursting charge.	No. of segment.	Charge.
*7-in. pr. 70	82	7	10 0	76	in. cal. 1 37	98	8	98	3	112	lb. 11
64	shunt	gun	—	—	—	—	—	—	—	—	10 9 8 6
40	{ 32n. 35o.	4½	10 0	56	{ 1 37 1 38	38½	2½	39	10 oz.	72	5
20	13	3½	5 6	44	1 38	20½	1	20	1½ -	70	2½
12	8	3	6 0	38	1 38	—	—	10½	1 -	48	1½
9	6	3	5 2	38	1 38	—	—	9	11 dr.	41	18 oz.
6	3	2½	5 0	32	1 38	—	—	5½	6½ -	30	12 -

* Breech loader.

17. ANNATTO, or ARNOTTO, a species of red dye, formed of the pulp enveloping the seeds of the Bixa Orellana, a South American and East and West Indian plant. Commercial annatto is in two forms, flag and roll: the flag is packed in casks in pickle; the roll is in small baskets. It is made up at Cayenne in square casks, 2 to 3 lbs. each, wrapped in banana leaves; Brazilian is in rolls of 2 or 3 ozs. each. Bombay ton 50 cubic feet. A case nearly 2½ cwt. Hamburg tare 18 ¢ cent.

18. ANTIMONY, a metal shipped principally at Singapore; it is imported in the shape of ore, and commonly as ballast. By some it is termed the ore of crude regulus, which is conveyed in bulk and in cask. Specific gravity—regulus, 6'720; sulphuret, 4'500.

19. APPLES. In the United States barrels of apples are first perforated with holes for the admission of air, and also for the purpose of letting out water, in the event of the barrels getting wet; they are then stowed between decks, as near the hatches as possible, for the benefit of ventilation, bilge and cutline, with chocks between to prevent them working at sea. For conveyance to Liverpool they are frequently stowed on deck. Apples are greatly injured by the fumes from petroleum; see that article. In the United States a bushel of dried apples is considered to weigh 22 lbs. In Jersey a cabot is 38 lbs.; 13 lbs. local, 14 lbs. English.

20. ARANGOES, pierced beads of rough carnelian, of various shapes and qualities, formerly imported in considerable quantities from Bombay for re-exportation to Africa; the best are barrel-shaped and from two to three inches long. A ton for freight 20 cwt.

21. AREKA NUT. The areka palm is the *Areka Catechu* of botanists; it is a palm of elegant growth, rising with a very erect and small stem to the height of 40 or even 60 feet, the summit terminating in a tuft of dark green foliage; the circumference of the trunk is seldom more than 1½ to 2 feet; when of early growth it is dark green, and when old of a dark grey colour; the circles formed by the clasping petioles of the fronds being very visible upon it: the tree bears fruit only once during the year, at which period the tree, with its long branches of orange oval-shaped fruit, pendant from the upper part of the trunk, contrasted by the dark-green foliage, has a beautiful appearance. The fruit grows in long pendulous clusters, each about the size of a small hen's egg; the external covering is thick fibrous, covered by an orange-coloured epidermis; and on the thick fibrous husk being cleared away, the nut is discovered surrounded by its own immediate epidermis, which often proves difficult of removal. The nut is conical, but varies in some, having an elevated apex and small base, and others a large base and very slightly elevated apex. It is the principal export from Pedir, and when new will lose eight to ten per cent. during a passage to China, where it is used in large quantities as a masticatory, especially in Canton, Quangsi, and Che Keang. May, June, and July are the months for collecting the nuts. A cargo generates so much heat as to raise the thermometer in the hold 40° above that on the deck; and from this circumstance, and the quantity of heat generated, the crew are prevented from sleeping between decks. The heat is said to be so excessive that the carpenter of a ship, when desirous of bending some wood, placed it under the main hatch, among the nuts; in a few minutes it was sufficiently strained for its intended purpose. After a fortnight or three weeks the heat is materially moderated. The areka nut is produced in the island of Sumatra. In commerce this fruit is incorrectly called betel nut. Many writers consider it the fruit of the piper betel or betel vine, the leaves of which are used with the areka nut as a masticatory; but as the whole are mixed together and eaten by the natives, constitutes what is called "chewing the betel" by Europeans—hence the commercial application.

22. ARROW ROOT is a native of South America, but has long been introduced to the East and West Indies. At Bermuda the

harvest is in November and December ; the ports are St. George's and Hamilton, and the chief **season of shipment** is in January, February, and March. The sizes of packages are variable and arbitrary ; boxes 1 foot long by 6 inches broad and 6 deep, contain 6 lbs. ; and 16 inches by 8 and 8, 10 lbs. ; a box made to hold 5 lbs. measures *inside* 10 inches by 6 and 3 ; casks vary from 20 lbs. to 100 lbs. ; half-barrels containing about 90 lbs. net are much used ; the average weight of boxes is 8 lbs., and casks 30 lbs. The tare on 6 lb. boxes is 1 lb. 5½ ozs. The weight relatively is nearly the same as wheaten flour. Jamaica arrow root is considered inferior to that from Bermuda. It must be kept perfectly dry ; the least damp will run through and spoil the whole contents of a box. Exporters prefer the 'midships for stowage. Bermuda arrow root is freighted at per lb. ; a ton in cases at Bengal, Madras, and Bombay, is 50 cubic feet.

23. **ARSENIC** is imported principally from Saxony and Bohemia ; specific gravity sulphuric 1·840, white 3·700. British casks weigh 3½ to 3¾ cwt. gross ; tare 23 to 28 lbs. Bombay ton 20 cwt.

24. **ASHES.** Bone Ashes from the River Plate and the Brazils are dunnaged with bones, covered with hides ; they should be shipped perfectly dry to prevent spontaneous combustion. Pearl and pot ashes are also injured by water, and when wet will damage manufactured goods ; dunnage 9 inches in the bottom and bilge, 2½ against the sides ; see the articles charcoal and hides.

Tonnage. 80 casks of pearl and pot ashes, weighing 16 tons, will occupy 850 feet or 1 keel. 20 cwt. pot ashes go to a ton at New York. When wheat is 1s. 4 quarter freight, ashes are rated at 1s. 2½d. ¾ cask. Baltic ashes receive two-thirds the freight of clean hemp, on the gross weight. A cask of American weighs from 3½ to 5 cwt. ; St. Petersburg cask 10 cwt. ; a barrel of pot ashes 200 lb. ; 12 barrels make a last.

25. **ASPHALTE**, at Trinidad, runs from an inland lake to the sea and at low water is dug up from the beach with pickaxes. Pitch is extracted from it. The cargo of the first vessel amalgamated when crossing the Line ; she was long on one tack, and the asphalt settled imperceptibly. The brig *Mignonette*, of 182 tons register, loaded 250 tons Trinidad asphalt, when she was nearly two-thirds full. In her case spars were laid athwartships, planks laid against them, and a quantity of branch-wood, 5 or 6 feet long, was fixed to the planks, and well white-washed to prevent sticking. She had also fore and aft shifting boards, rising 4 feet from the surface, to keep the cargo from shifting. The brig arrived safely at Havre ; the asphalt was dug out of the hold with difficulty. With 250 tons Patagonian guano she was two-thirds full.

26. ASSAFŒTIDA is the concrete juice of the *Ferula Assafetida*, a tree which grows in Persia. It is packed in boxes $35 \times 20 \times 20$ inches, containing about 4 cwt., and in baskets 28 lbs., and is usually shipped at Bombay. Assafetida must be stowed clear of all edibles in the hold, which requires complete purification before most other cargoes are received. Vessels exclusively employed to carry this drug, are so scented with the odour that they spoil most other goods. A ton for freight at Calcutta and Madras is 20 cwt. ; at Bombay 50 cubic feet.

27. AVERAGE, GENERAL. A general average is that which has been sustained by the sacrifice of some part of the ship or cargo, for the safety or preservation of the whole ; and this loss is made good to the party on whom it falls, by an average contribution upon all, termed a general, gross, or extraordinary contribution, upon the amount of the ship, cargo, and freight. This rule has been adopted in all modern systems of maritime jurisprudence, from the famous Rhodian law, "concerning throwing overboard," by which it is provided, that "if, for the sake of lightening the ship, a throwing overboard of the merchandize be made, what is given for all, must be made good by the contribution of all." The Average Clause in Marine Policies of Insurance is as follows :—"corn, fish, salt, seed, flour, and fruit, are warranted free from average, unless general, or the ship be stranded ; sugar, tobacco, hemp, flax, hides, and skins are warranted free from average under 5 $\frac{1}{2}$ cent., unless general, or the ship be stranded ; and all other goods, also the ship and freight, are warranted free from average under 3 $\frac{1}{2}$ cent., unless general, or the ship be stranded." There is sometimes a variation in these per centages.

28. BACON should be kept as dry and cool as possible, and not stowed near dry goods, which it will injure. **Hams** and bacon for the Australian colonies are stitched up separately in coarse sacking, and placed on the top of the cargo. Hams are often put in cases with oats to fill up, and sometimes in dry lime, which is said to preserve them most effectually. The freight of Irish bacon in bales is reckoned on the gross weight, which is generally stamped on the tallies attached to each bale. In 1864, the brig *Billow* took in bacon at New York for Cork ; 183 tons register, $97 \times 23\frac{1}{2} \times 13$ feet. The cases of bacon, 400 to 800 lbs. each, grossed only 206 tons ; the master expected 250 or 260 tons. Her cargo of Newport steam-coal, screened once, was 308 tons, and space was left for 20 tons additional ; draught 13 feet aft, 12 $\frac{1}{2}$ forward. In computing freight of hams at

Baltimore 200 lbs. net, are considered equal to a barrel of five cubic feet. Irish bacon is usually in bales, 3 cwt. net; American boxes about the same.

29. BALE GOODS should be slung when hoisted in or out, and never suspended by sharp hooks. They should be stowed on their *flats* in 'midships, and on their *edges* in the wings, excepting the ground tier, and should never be placed against the masts or pump-well, or near sand ballast, or any damp goods. Manchester bales, when screwed in hydraulic presses, are tightly fastened with iron bands rivetted together; unless there are battens or thin splints of wood inside the bands, those parts between them swell out immediately the bale is relieved from the press, and are very liable to be injured by chafe. When a ship rolls from side to side, especially in boisterous weather, there is apparently a constant effort of the decks and beams to regain a horizontal position, and the doors, internal frame-work, panelling, and bulk heads, give evidence of this effort by creaking and sliding up and down every time the ship inclines. Similar movements prevail in the hold, and with the addition of those caused by pitching and tossing, the cargo is sometimes chafed. Unprotected bales are often injured, and then become a fruitful subject of dispute between the supercargo and consignee; they should, therefore, be well blocked off and firmly chocked. It is, however, desirable that bales intended for long voyages should have chafing pieces, or be otherwise protected from those unavoidable casualties. Bales without chafing pieces should be so noted in the bill of lading. Careless stevedores, when handling uncorded bales, will whip the ends of cotton hooks into and greatly injure them; at Syra, half the freight is deducted for bales which are chafed or torn by hooks. Bales for Lagos or Accra are cased in oilskin or gutta percha, to prevent injury by water, through which they are pulled a long distance, in consequence of the shoalness of the coast.

30. A city merchant of some experience in the export trade to the Cape of Good Hope (5th December, 1866), says: "we had two cases of long-cloth lined with oil-cloth, per *Midlothian*, in 1861, which were damaged by sea-water; since then our shipments have been almost exclusively by the mail steamers, and scarcely any damage has occurred. I have been twice out to the Cape during the time, and have seen the goods opened, having taken some trouble to get ours out in good condition. Lining cases with oil-cloth is a delusion; it does nothing that stout brown paper would not do, and I never opened a moderate-sized case without finding the oil-cloth at the

corners like a sieve or in holes. We use tarpaulin as a lining for very low goods, but all fine goods, excepting the very low qualities, should be in zinc or tin, and bale goods in double tarpaulins with painted hoops. From what I have seen in the Colonies, I firmly believe that quantities of goods sold on account of the underwriters are not damaged by sea-water, but by being packed damp, or rather not so dry as they should be, especially moleskin, cords, and boots." In confirmation of the latter statement, a Plymouth draper of great experience, says : "that fustians and gloves placed even in a perfectly dry room, but kept close for six weeks, will generate dampness and become spotted and greatly deteriorated in value."

31. Cotton, hemp, and other screwed and pressed bales, are measured at Bombay, as follows : the greatest length is first ascertained, then the bale is set on end, and cross measurements are taken at top, over the lashings, excepting the knots ; an average of 100 bales is struck, by ascertaining the actual measurement of any ten bales, and proportionally—the shipper measuring one half and the commander or ship's agent the other half of the aforesaid quantity ; the bales to be measured on the wharf or bunder, prior to shipment, if required, weather permitting. The mode of measuring bales at Madras, as determined by the Chamber of Commerce, follows the Tonnage Scale for India at the commencement of this work.

Tonnage. All bale goods and all measurement goods are reckoned 40 cubic feet to the ton freight ; if the weight exceeds the measurement, 20 cwt. to the ton. Bales, packages, and cases, not weighing more than 15 cwt. to the cubic ton measurement, are designated as light freight. At Bombay 50 cubic feet go to a ton ; at New York and Baltimore 40 cubic feet of bale goods of all kinds.

32. **BALLAST** is a quantity of iron, stone, or gravel, or some similar material, deposited in the hold when there is no cargo or too little to bring the ship sufficiently low in the water. It is used to counterbalance the effort of the wind upon the sails, and give the ship a proper stability, that she may be enabled to carry sail without danger of oversetting.

33. There is no specific rule for the quantity required ; as a general rule, say half the ship's tonnage, builder's measurement ; see the article trim. Never take sand where stone is to be obtained ; but if compelled to take it, adopt every means to prevent its entering the limbers or pumps, by protecting them with pitched canvas, matting, &c., and by caulking the ceiling, or covering it with old mats or sails. Some masters lay a trunkway each side the keelson, to allow the water to run freely to the pump-well. When sand is shipped wet, allowance must be made for drainage, by bringing the vessel well

down; a cubic foot of wet sand weighs 118 lbs., of dry 88·6; specific gravities 1·9 and 1·42. To avoid the shifting of ballast, or even of coal, especially in sharp-built ships, when bad weather is expected, the hold is sometimes fitted with ballast stanchions and boards. The lower ends of the stanchions are set in at the keelson, and the upper lashed to the beam, a few feet from the side; five or six on each side, with planks lashed or nailed fore and aft to the stanchions, 12 to 18 inches apart; the ballast is thus divided into three portions, which prevents possibility of shifting; the stanchions for a ship of 300 tons should be about 8 inches. The use of flat wood stanchions, as wide as the beam, may answer the same purpose, and leave more space for stowage. Sand or damp gravel should be covered with boards to receive bale goods; the dampness from sand will injure sugars or other similar goods in boxes, stowed on beds, in consequence of the settlement of the beds; it will reach and inevitably spoil lucifer matches, although stowed at a distance from it, and it stains the exterior of cases and casks—the hoops of which are oxydized by it. With sand ballast or any similar article liable to saturation, too much reliance should not be placed on the apparent quantity of leakage indicated by the sounding rod.

34. It has been suggested by Mr. HAYWARD, LLOYDS' agent at Madeira, that when pumps become choked with sand ballast at sea, they should be taken up and closed at foot, and that an aperture should be made at a convenient distance above, so as to draw the leakage off free from sand, which, through its specific gravity, is always most troublesome in the bottom. Capt. BRAITHWAITE, of the *Moodie*, took in 100 tons of sand ballast when he left Hull in December, 1860, and having encountered heavy weather, with much pumping, had not more than 60 or 65 tons left on arrival in Wingoe Sound, Norway. He attributes the safety of his ship to the height of her keelson, which prevented the sand from silting to leeward, and he determined next time to put 40 tons of stone or rubbish under the sand ballast.

35. Ships departing from the United Kingdom to foreign ports, having only passengers and their baggage on board, and vessels laden only with chalk or slate, are deemed to be in ballast; see Customs Laws Consolidated Act, 1876. In some Colonial and other ports sand only is to be had; and when in the tropics, it becomes so dry that it is often driven into and through the bale sacking by the force of the wind, as the vessel rolls, much to the injury of the contents; it is also liable in this state to render the cargo quite unsafe, from

the rolling and shifting which ensues; it may become necessary to make the sand more solid by wetting it. Copper dross is sometimes used, its weight is advantageous, but it stains the cargo unless covered with plank; shingle or lead is better; the common buhr stone answers the double purpose of ballast and dunnage. Other kinds of ballast are mentioned in connection with the various articles of freight. When a ship has a cargo of light goods, such as wools, madders, cork, &c., and she is ballasted with heavy goods, the freight of the latter is usually only one-third of the rate payable on a full cargo of the like description of goods. At Amsterdam a last of ballast is 2,000 lbs. At Madras a load consists of 120 baskets of sand, according to a fixed price, at the average of $3\frac{1}{2}$ fanams, 12 of which go to a rupee.

ADMIRALTY PIGS OF IRON BALLAST.

No. to ton.	Length.		Breadth.		Depth.		Weight.		
	ft.	in.	ft.	in.	ft.	in.	cwt.	qr.	lb.
7	3	0	0	6	0	6	2	3	12
9	2	5	0	6	0	6	2	0	24
11	2	0	0	6	0	6	1	3	7
16	1	6	0	6	0	$4\frac{1}{2}$	1	0	12
18	1	6	0	5	0	$4\frac{1}{2}$			
20	1	5	0	$5\frac{1}{2}$	0	$4\frac{1}{2}$	1	0	0
21	2	0	0	4	0	4		3	22
40	1	0	0	4	0	4			

36. BALSAM COPIVI, or COPAIBA, a yellowish medicinal stimulant oil, obtained from the *Copaifera Officinalis*, and other species, in tropical climates; it should be kept apart from all dry goods, which are liable to be injured both by its resinous qualities and through the offensive odour with which it impregnates them. It is imported in casks from 1 to 4 cwt. each.

37. BAMBOO REEDS are usually in bundles 10 to 15 feet long, weighing on an average about 20 lbs. 3,000 or 16 cwt. go to a ton at Bombay.

38. BARILLA is an alkali obtained by the combustion of seaweeds. British barilla is the crude soda-ash produced from common salt in the carbonate of soda manufactories. It should have firm dunnage, such as oak staves, &c., say 9 inches in the bilge and 6 in the flat. Brushwood and fagots are sometimes used in Sicily and Spain, but they get compressed by the continued weight of the cargo,

and endanger the safety of the ship. Barilla should be heaped up towards the hatches ; a full cargo cannot be carried—say a little over three-fourths. When wine is freighted in the same ship, it should being lighter, go in the ends, and the barilla in the main hold. Bengal, Madras, and Bombay ton 20 cwt.

39. BARK should be dunnaged about 6 inches at the keel, and 10 in the bilge, sharp vessels less in the bilge ; it must be well rolled down, for no vessel can take her tonnage of bark. Peruvian bark is in small bales of about 112 lbs. each, well packed in dry hides, and sewn together carefully ; in this condition it is bought on the coast at \$16 \pounds quintal, and after being manufactured into quinine in England is sold to the chemists there at about 10s. \pounds oz. Peruvian bark is very delicate, requiring great care ; the least wet on one side of a bale runs through and spoils the contents. It is seldom stowed in the lower hold, being considered a 'tween deck cargo, and requires to be well dunnaged in the wings, and ought not to be placed near the masts, chain-lockers, or pump-well. When shipped at Adelaide in bags or bales, permission should be given on the bill of lading, to cut the packages, or the ship will be liable to make up to a great extent the loss by weight, if any, and the damage, if it arises, from the bark being cut loose.

40. The barque *Fugitive*, 471 tons, Capt. W. R. BARWOOD, belonging to Messrs. T. B. WALKER & Co., of St. Helen's Place, London, left Launceston, Tasmania, 20th March, 1867, with a cargo, including

220 Tons of mimosa and silver wattle bark,
150 Tons of wheat (1,240 sacks),
1,005 Bales of wool, and sundries.

Her ballast, 60 tons of dry ironstone shipped at Launceston, was used as dunnage, covered with wood, say in the bottom 12 inches, bilges 16, and sides 3 to 4 inches. A tier of bags of bark (being less perishable and not liable to be attacked by vermin), was spread all over the floor dunnage to receive the sacks of wheat, which were protected in a similar manner by the bark, wherever necessary. Wool in the ends of the vessel and the 'tween decks. So laden, she drew 15 feet fore and aft, and on arrival in London, 20th June, two inches less by the bow ; with a dead-weight cargo of iron, &c., 16 feet aft and 15 feet 9 inches forward ; her best trim at sea is, say, 14 feet aft and 13 feet 9 inches forward. The bark was mostly packed in large-size corn sacks, or sacks of the same material, weighing 3 lbs. each ; the mimosa, when filled, 190 to 200 lbs. ; silver wattle 15 to 20 \pounds cent. less ; measurement, say 8 cubic feet. From 11 to 13 of these weigh

a ton (20 cwt.), according to the fineness of the grinding, there being considerable difference in the working of the mills; varying from mere dust to small pieces of two and four inches. After being rammed into their places, the bags are rolled down by a cask filled with water, the bung being well secured with sheet lead. The **season of shipment** is from November to March. Both barks are used in England for tanning and occasionally for dyeing; sometimes they are mixed with oak bark; occasionally both are termed mimosa; mimosa is sometimes called black wattle. This bark is liable to injury from sea-water, or by contact with oil or with moist goods. As in all other Tasmanian ports, the bales of wool were hydraulically pressed and iron-banded; they average $58 \times 28 \times 28$ inches, and weighed 300 lbs.; say $6\frac{1}{4}$ to the ton; freight at p^{r} lb. Capt. BARWOOD states that a measured bushel of Tasmanian wheat, which is equal in quality to any grown, will weigh 63 lbs. The sacks in his cargo, which contained $3\frac{1}{2}$ bushels, weighed 213 lbs. gross; freighted at p^{r} bushel of 60 lbs. The **port charges** of the *Fugitive* were, inwards $\text{£}3$ 18s. 6d., outwards $\text{£}18$ 19s.; **pilotage** in $\text{£}23$ 11s., out $\text{£}23$ 11s. The river Tamar can seldom be navigated without the assistance of a steam-tug, which in this case cost $\text{£}56$ 8s. for towing both ways, but that is not always necessary.

Tonnage. 10 tons tree bark, or 8 tons coppice, will occupy 850 cubic feet or 1 keel. In the East Indies the ton is 8 cwt. When Mediterranean wheat is freighted at 1s. p^{r} quarter, bark of oak is rated at 9s. 9d. p^{r} ton of 20 cwt.

41. **BDELLIUM**, a gum resin, semi-pellucid, and of a yellowish brown or dark brown colour, something like myrrh in appearance, internally clear, and somewhat resembling glue. It is produced in Persia, Arabia, and India. Bombay ton 50 cubic feet.

42. **BEAM FILLINGS.** To stow these properly is one of the most important duties of a stevedore. When the cargo reaches from the ceiling up to the hold beams, it becomes necessary, with most descriptions of goods, to alter the stowage; by a little foresight, a sufficient quantity of suitable articles could be retained for this purpose. The great object is to avoid the loss of bulk between the beams, and to carry the fillings high enough to prevent the upper cargo from resting on them, or they may break, and thus endanger the safety of the ship, especially when rolling in heavy weather; two inches is considered sufficient for timber, other goods, not so compact, will require a greater height; the fore-castle-deck and the half-deck should not be overloaded with heavy goods. When the cargo is timber, and the hold under the beams have been filled, the beam

filling logs are stowed a-burton or across the ship ; and these logs should be stout enough to stand 2 or 3 inches above the beams, so that the 'tween decks cargo shall rest on them, and not on the beams. Of course, this cannot be done if a 'tween deck is laid.

43. **BECHE-DE-MER**, one of the products of the Fiji Islands, is exported thence to the Australian colonies for the use of the Chinese immigrants ; it is also collected from many of the islands in the China sea.

44. **BEES' WAX** is made up at **Sierre Leone**, in packages of various sizes, often in return cases. In Sydney, Adelaide, and Tasmania, it is in irregular cakes, and is usually packed in cases about 2 feet by 18 inches, containing 1 cwt. each ; **shipments** occur all the year round. Bees' wax shipped from Zanzibar is usually run into empty beer hogsheads, having been melted, skimmed, and purified. Being brought generally in a very dirty state from the mainland and Madagascar, the chief mate should be careful to see that each cask is well coopered before being stowed, and that flat-headed scupper nails should be driven in close to the outer edge of each hoop as the cask lies on its bilge—two nails at least to each hoop. The casks are likely to shrink when the heated wax is poured in, and hoops will consequently drop off, and the package fall to pieces, unless some precaution is observed. Bees' wax should be stowed in a dry part of the ship, not over water or any other liquid. Specific gravity 0.964. Madras ton 20 cwt., Bombay 50 cubic feet in cases, New York 40 cubic feet. Baltic bees' wax in mats receives two-thirds freight of clean hemp per ton of 63 poods gross ; in casks the full freight.

45. **BETEL NUT**. Betel or *pawn*, as it is denominated in Bengal, consists of part of the fruit of the areka palm (see areka nut), wrapped in the leaves of a kind of pepper plant called *betel*, smeared with a little shell lime, whence its name betel nut is derived. It is much used in the East, and is generally packed there in gunny bags containing 100 lbs. each ; in some parts twenty of these go to a ton. It should not be stowed over oil or water. A ship took a quantity into her main hold, and covered them with plank flooring ; she then went to a second port in the East Indies, and placed bales on the planks. Although the nuts were perfectly dry when shipped, a vapour arose, settled against the under side of the hold deck, and fell in drops on the bale goods, which were rotten and worthless at the end of the voyage. On the Pedir coast the **chief exports** are in May, June, July, and part of August.

Tonnage. Bengal and Madras ton 18 cwt., Bombay ton 16 cwt., in bags. At Pedir, in Sumatra, betel nuts are sold by the laxar, about 168 lbs., or 10,000 nuts, to which 10 to 25 ¢ cent. are added for those worm-eaten or damaged.

46. **BILLS OF LADING.** Before **signing** read them, and if in Great Britain, see that they are stamped (for signing an unstamped one a master is liable to a penalty of £50); never sign unless the goods are on board the vessel—not even if they are alongside—for should they from any cause not be shipped, the master will be held liable for the value of the goods that he has admitted to have received, do not sign in such a case, although a letter of indemnification may be offered by the shipper, such letter not being in any way binding on the holder of the bill of lading. When bills of lading are presented for signature, “stating specific quantities and qualities,” unless you are aware these statements are correct, it is much better to insert the words, “said to be,” above or before the statements referred to. The master is not liable for any bill of lading that has not been signed by himself, unless he authorized some other person to sign as his agent. It has been held in our Courts of Law that writing in a bill of lading over-rides printing, in cases where one is in contradiction to the other. If the master has the permission of the shipper to unbind a package for the convenience of stowage, or if he has permission to carry cargo on deck, such permission should be stated in the bill of lading. Where a mate’s receipt has been given, have it returned previously. It is the duty of the master or mate to enter in the cargo-book a correct account of all goods received, and see that the bills of lading are in accordance therewith.

47. Nothing should be received on board in a **damaged state**, without a note to that effect being inserted in the bill of lading, and a letter of indemnity from the shipper. It is no answer to say the goods are in the same order as when received on board. Shippers will seldom allow the words “in bad order” to be inserted, and they are said to be of no protection to the master. A letter of indemnity leaves his remedy against the charterer only, and not against the consignee. The best way is, if possible, to refuse all goods in bad order. Bales without chafing pieces should be so noted on the bill of lading. Where from its length a special memorandum on a bill of lading, requires to be placed on the side or back, it should be endorsed by all parties concerned. When goods are to be carried **on deck** it should be stated on the bill of lading, so as to free the owners from responsibility in case of damage or jettison; see the case **MELLOR v. CHAPPLE**, in the article cotton. The master’s copy

of the bill of lading ought to be signed by the shipper, and receipted by the warehouse-keeper, or person authorized to receive the contents, on the delivery of the goods. Obtain written receipts for all goods delivered; see delivery. When it is not possible to know weight, quantity, quality, &c. of goods received—

*FOR**SAY*

Freights in general	Weight and quantity unknown.
Perishable articles	Not accountable for loss by natural decay of the articles; freight to be paid for the articles shipped.
Goods in bad order or apparently so ...	In bad order or apparently damaged.
Goods received at a reduced rate as dunnage	Shipped as dunnage.
Grain	Quantity and quality unknown.
A number of pieces, in bales, of manufactured goods, linen, yarn, hardware, &c.	Number of pieces and contents unknown.
Bars of iron, bales of hemp, flax, and other packages	Contents unknown, or weight and contents unknown, and "three bundles of hemp in dispute, if on board, to be delivered."
Iron hoops, pots, camp ovens, &c.	Not accountable for rust.
Heavy goods, such as lead, iron, tin, &c.	Weight unknown.
Leakage goods, molasses, tar, turpentine, &c.	Not accountable for leakage as well as quality; quantity and contents unknown; freight to be paid on quantity shipped.
Wines, spirits, and liquids.....	Quality, quantity, and contents unknown, and not accountable for leakage.
If the number of gallons are expressed in the bill	Number of gallons and contents unknown, and not accountable for leakage.
Bottled goods	Contents unknown, and not accountable for leakage and breakage.
Earthenware and glass	Not accountable for breakage.
Sheep, cattle, horses, &c.	Not accountable for accidents and mortality.
In harbours of New Zealand, Natal, Table Bay, or any other open bay, especially in the colonies, unless extra freight be paid	To be taken from ship's tackles at the risk and expense of the consignee.

Ordinarily all bills of lading, except for specie and bullion, have the words "weight and contents unknown" inserted in them.

48. A master can demand to see the contents of a case, &c., if he suspects that it is damaged, or that it contains any unlawful or dangerous article, as gunpowder, &c.; see damaged goods and dan-

gerous goods. For bills of lading for acids, see the article acid, and for gold dust, precious stones, &c., the letter G; an Exchequer decision referred to there is entitled to the consideration of masters, as, under certain circumstances, it shows legal exemption from liability on other freights besides gold; see also the article cochineal.

49. If not in opposition to the custom of the port, or where it can be so arranged, when goods are conveyed **by boat**, let them be at the shipper's risk until they are on board, and when a vessel is discharged in a river, roadstead, or bay, endeavour to let them be at his risk after going over the vessel's side. If goods are conveyed **by lighter**, let them be brought to and taken from alongside at the risk of the shipper at port of loading, and at the risk of consignee at port of discharge.

50. Masters should not sign bills of lading which specify a **less rate of freight** than that named in the charter-party, otherwise at his port of delivery, he will only have a lien on the cargo for the bill of lading freight; any balance remaining to make up the chartered freight will have to be obtained from the charterer. When there is a charter-party, the bill of lading should say all the conditions of charter-party, dated, &c., shall be obligatory on the holder of the bill of lading. In signing bills of lading, see that the number of bills of each set to which you "affirmed" are duly stated; otherwise each bill may be presented as a separate document, and the same parcel of goods demanded more than once—this really occurred in the West India trade.

51. A master is not justified in refusing to sign a bill of lading (where the cargo is general), simply because the number of lay-days is not named therein. If, without sufficient cause, a master refuses to sign a bill of lading before proceeding to sea, any proved loss to the owner or his agent will fall on the ship.

52. The bill of lading is the receipt of the master for the goods shipped on board, and his undertaking to deliver them at the port of discharge; being transferable by endorsement, from one person to another, it is essential that the master should be satisfied who is the possessor of the bill of lading before he delivers the goods represented by it. On the faith of the master's signature, the purchaser of the goods is induced to pay for them before they arrive at their destined port. The master or owner is responsible for the due performance of the bill of lading. When a marginal note is inserted or an addition made it should, to prevent litigation, be initialled by both parties. The Collector of Customs, according to the Customs Consolidation Act, 1853, can demand to see bill of lading; penalty for refusal £100.

53. The Minister of Commerce in **France** communicated to the Chamber of Commerce, in August, 1866, the following letter from the French Consul at Dublin :—" I think it my duty to point out to your Excellency certain precautions, the non-observance of which on the part of our captains, aggravates a circumstance already bad in itself, and even frequently prevents them from having recourse to the Civil Courts in cases in which, feeling themselves perfectly in the right, they would be disposed to carry before them their differences with consignees."

" Bills of lading and charter-parties ordinarily announce that the freight will be paid according to the number of hectolitres of grain delivered—that is to say, after measurement ; but, on the other hand, the same documents set forth, that the cargo weighs on an average a certain number of kilogrammes per hectolitre, and a total weight which is inscribed in figures and letters. The master admits having received the weight as well as the measure, and undertakes to deliver one and the other to the person demanding the cargo. Now, it happens very often, that in consequence of waste, or accidents at sea, which have reduced the grain during the voyage, or on account of an unfair or even fraudulent weighing, or of an arbitrary conversion of French weights and measures, there is a notable deficit in the total weight to be delivered by the master. The merchant, taking advantage of the terms of the bill of lading, requires from the captain the value of the grain wanting, and, besides, only pays him his freight on the weight, not according to the number of hectolitres delivered, which frequently exceeds the figures in the document, notwithstanding the deficit in weight. According to the decisions of the courts in this kind of case, the merchant would be bound in any state of things to pay according to the number of hectolitres delivered, and this augmentation would compensate what might be wanting in weight. Most of the English captains who take cargoes in France for the ports of their country, take care to write on the documents they sign '**weight unknown**,' and that clause guarantees them in **Ireland** against the difficulties raised by the merchants. Our captains, therefore, would avoid much annoyance in the ports of Ireland if they took the precaution of writing '**weight unknown**' on all the documents they sign. As, however, it may be that they cannot get that clause inserted, they cannot be too strongly recommended to make certain at the moment of loading that they receive on board not only the measure, but the weight indicated in the bill of lading. It would appear that they content themselves too often with average

weighings, which are not sufficiently exact to make up the total weight, which will be rigorously demanded at the unloading.

“Another very important recommendation which should also be made to captains, is relative to the declarations which it is necessary they should cause to be written in their bills of lading, in order to be protected against the chicanery of consignees as regards the indemnity for **demurrage**. The clauses relative to the regulation of demurrage are ordinarily only set forth in the charter-party, to which the bill of lading generally refers in a very vague and indirect manner by the insertion of the words ‘freight according to the charter-party.’ This declaration is far from being sufficient for Ireland, for in this country it is the bill of lading alone which is of authority in justice. It follows, that in order that the stipulations in the charter-party relative to lay-days may be obligatory for the consignees, the bill of lading must absolutely bear the words—‘all the conditions of the charter-party shall be obligatory for the holder of the bill of lading.’”

“Captains often cause to be placed in the margin of the bill of lading the mention of the **lay-days** for the unloading, instead of mentioning them in the body of the bill of lading itself. This also affords opportunity for chicane on the part of consignees of bad faith, who do not fail to take advantage of the enactment of the law which requires that all the conditions stipulated shall be inserted in the body of the document. The captains should take great care to conform to this enactment.

54. At **St. Petersburg** it is necessary that bills of lading should specify the weight, measure, or quantity of each package of all goods, or they pay double duty as a fine. If more is found than specified, the surplus is confiscated; if less, the duty must be paid on the quantity specified. Of wine, it is not sufficient to state the number of pipes or hogsheads only, but also their contents in gallons, &c. Of lemons the number in each box. Of manufactured goods, the measure of each piece, and the number of pieces in each bale. It is indifferent whether the gross or net weight is specified. If the packages are all of the same weight, measure, or contents, a general specification will do; as for example, 100 casks of alum, of 17 lis-pounds each. Of dye-woods, the weight of the whole need only be mentioned. Of goods of small bulk, as pepper, &c., it is sufficient to state the weight of every five or ten bales, but with specification of the numbers. There must not be any erasures or blots on the bill of lading. All goods not accompanied with these documents, or where the documents are not according to the above regulations, will be sent back

55. The **Bombay** Chamber of Commerce has found it necessary to condemn the practice frequently adopted there, of procuring signatures to bills of lading before the goods are shipped.

56. At **Singapore**, in 1866, a very important decision was arrived at: a bill of lading had been signed in England for "83 tons steam coal" "freight payable at the rate of 25s. $\frac{1}{2}$ ton of 20 cwt. in full, less 5 $\frac{1}{2}$ cent. for loss in weight;" in the margin the amount of freight was calculated thus: "£103 15s., less 5 $\frac{1}{2}$ cent. (£5 3s. 9d.), £98 11s. 3d." At foot, the master, while signing, had written, "not accountable for weight." On arriving, the coal was weighed from the ship's side, and found to be only 75 tons 11 cwt., and the consignee refused to pay freight on a larger quantity. On the part of the ship, it was contended that the terms of the bill of lading amounted to a special agreement, that whatever the coal turned out—over or under the specified quantity—freight should be paid upon 83 tons, less 5 $\frac{1}{2}$ cent. Having gone to umpirage, the following case was submitted by the ship's arbitrator:—"the bill of lading is drawn out for a specified quantity, but the clause at the foot of that document, to the effect that he was not 'accountable for weight,' binds the master, I think, to deliver only what he has on board, and holds him harmless in the event of the quantity delivered proving short. The freight appears to be not payable upon net weight delivered, but, by special agreement, upon the supposed quantity shipped, less an allowance of 5 per cent., to cover probable loss on weight; and I consider the vessel to be entitled to the full amount of £98 11s. 3d., as stated on the margin of the bill of lading, whether the deficiency on the out-turn is, or is not, in excess of the said 5 per cent." The case for the consignee was put by the other side as follows:—"according to the bill of lading, freight is payable as per margin on the quantity inserted in the body of the document. The clause less 5 per cent. for loss in weight protects the ship, in my opinion, to that extent from any claim for short delivery. But if the ship is entitled to receive freight on 83 tons, less 5 $\frac{1}{2}$ cent., it must surely be allowed that the consignee, after having paid that freight, has a claim upon the ship for any quantity that may be short delivered. This may be settled by the ship paying for the difference, 3 tons 6 cwt., either at market value or the original cost and freight of that quantity. The clause inserted by the master at the foot of the bill of lading, 'not accountable for weight,' is not, I think, of any importance. Freight is claimed by the ship on 83 tons, less 5 per cent., and the consignee, on paying that freight, is entitled to receive the quantity specified, or an equivalent for short delivery." The umpire, before giving his

decision, referred the case, as well as the opinion of the two arbitrators, to the Committee of the Chamber of Commerce, and the decision was finally given in favour of the consignee, viz. :—that the ship be paid freight on the quantity delivered—showing that a special agreement must be very distinctly worded to overrule the custom of the port. Had the freight been stated at the £98 11s. 3d., without reference to the rate per ton, then the case would have been different ; but the stating of the rate pre-supposes the freight to be in some measure guided by the quantity, and the custom of the port does the rest.

57. In the **United States**, three important cases referring to bills of lading have been decided. **FIRST** : in the absence of any proof on the part of the consignee, as to the condition of the goods when shipped, the master was held to be free from liability, as the bill of lading contained the clause “weight and contents unknown.” **COLOMBO v. OTTO**, New York, 6th September, 1856. **SECOND** : packages of goods in the form of barrels, &c., bound with matting, and secured with cords, were shipped at Hamburg for New York ; on arrival, one package was found broken and the contents damaged. It was proved that by ordinary inspection, the damage might not have been discovered on shipment ; there was no evidence of condition when shipped, except the bill of lading, which said “weight and contents unknown.”—Held that it was not sufficient to show that the package was whole when shipped. **COLOMBO**, 15th September, 1856. **THIRD** : a bill of lading, granted for a specified number of tons of iron, “weight unknown,” binds the owner to deliver only so much as is actually received on board. **SHEPHERD v. NAYLOR**, Massachusetts, March, 1856. See also the recommendation in the article masters.

58. **Wool ; a comma !** Court of Common Pleas, 13th December, 1862. **THE RUSSIAN STEAM NAVIGATION CO. v. SILVA**. (Before Lord Chief Justice ERLE.) This was an action against a wharfinger in Tooley-street, for delivering up to the consignee of certain bales of wool, conveyed by the Company's steamer *Odessa*, from the Black Sea to London, the goods in question, without receiving payment of the freight due to the Company, and notwithstanding a “stop order” had been lodged with him not to part with the wool until the freight had been paid, and until he had received plaintiff's release. The defence was, that defendant did receive the full freight inserted in the bill of lading before parting with the goods, viz. : 80s. $\frac{7}{8}$ ton of 20 cwt., gross weight ; and, although it might be contended that according to the custom of the trade and the rightful interpretation of what the bill of lading intended to convey, he ought to have demanded three times 80s. $\frac{7}{8}$ ton. His excuse was that he had been led into a mistake through the improper punctuation of the bill of lading. To explain this it is necessary to state that, according to the custom of the Baltic trade for the previous 35 years, a certain standard of rates exists by which all freights are calculated. Thus, starting with

tallow, a cargo of tallow would only pay two-thirds of a cargo of hemp, and one-third of a cargo of wool. In the present case the bill of lading ran thus : shipped," &c., "150 bales washed Donshay wool, at the rate of 80s. $\frac{2}{3}$ ton of 20 cwt., gross weight, tallow other goods, grain or seed, in proportion, as per London Baltic printed rates." Supposing, therefore, the comma to have been placed after instead of before the word "tallow," as it ought to have been, the defendant would have been without any excuse, as there is not the slightest doubt about the custom of the trade, although he professed himself entirely ignorant of it. But having regard both to the custom, to the express reference to the Baltic printed rates in the bill of lading, and to the acknowledgment of defendant that he parted with the goods without having first procured the release of the plaintiffs, the jury unhesitatingly found that defendant ought to have demanded 240s. $\frac{2}{3}$ ton for the wool, instead of 80s. $\frac{2}{3}$ ton ; and so, according to defendant's contention, he lost his action all through a comma. His lordship, however, gave Sergeant PARRY leave to move upon the point if he desired to do so.

On the following week, in the Common Pleas, the *RUSSIAN STEAM NAVIGATION CO. v. RUDOLF*. (Before Lord Chief Justice ERLE and a special jury.) An action to recover the freight of a number of bales of wool, shipped on board plaintiff's steamer *Odessa*, at Odessa, and consigned to defendant. The facts are the same as at the trial of a similar action brought by plaintiffs against the wharfinger of the Gun and Shot Wharf, for delivering the wool before the whole freight was paid. The question at issue was, what was the amount of freight due upon the wool. The bill of lading specified that 150 bales of wool were shipped at the rate of 80s. $\frac{2}{3}$ ton of 20 cwt. gross weight ; tallow, other goods, &c., in proportion, as per London and Baltic printed rates. It was averred that tallow was taken as the standard in the trade, and it was stated as a well-understood custom, that wool paid two-thirds more freight than tallow. Mr. WATKYN WILLIAMS having opened the pleadings, a consultation took place between the learned counsel engaged in the cause, and Mr. Sergeant PARRY, who appeared for defendant, said it had been arranged for the present to make a remanet of this cause to abide the result of the action which was tried 13th December. He would have to move upon the former case, and as the full court dealt with it, so would their proceeding in this action be governed. The Chief Justice said a great deal depended upon the construction put upon the bill of lading. A juror was accordingly withdrawn.

On the 15th January, 1863, in the course of delivering final judgment, Justice WILLIAMS said : "as defendant has undertaken to act upon the bill of lading, he was bound to make himself master of its true meaning, and cannot plead ignorance as an excuse. Having parted with the goods without seeing that the proper amount of freight was duly paid, he has broken his undertaking, and must pay the penalty." Justices WILLES and KEATING, and Chief Justice ERLE concurred.

SAILING-SHIP BILL OF LADING.

SHIPPED in good order and well conditioned by _____ in and upon the good ship, called the _____ whereof is master for this present voyage _____ and now riding in the harbour of _____ and bound for _____ being marked and numbered, as in the margin, and are to be delivered in the like good order and well condition, at the aforesaid port of _____ (the act of GOD, the Queen's enemies, fire and all and every other dangers and accidents of the seas, rivers,

and navigation of whatever nature and kind soever excepted) unto
or to assigns. Freight for the said goods with primage and
average accustomed.

In witness whereof, the master or purser of the said ship hath affirmed to
bills of lading, all of this tenor and date, the one of which bills being
accomplished, the others to stand void.

Dated in the day of 187

Weight and contents unknown.

STEAM-SHIP BILL OF LADING.

Eastern Trade Bill of Lading Outwards, No. 2—vit "Suez Canal."

SHIPPED in good order and condition, by on board the steam-ship
 whereof is master for this present voyage lying in the port
of , and bound for vit the Suez Canal, with liberty to discharge
and receive goods and passengers at and to take in coal or other necessary
supplies at any intermediate port or ports, to sail with or without pilots, and to
tow and assist vessels in all situations of distress.

 being marked and numbered as per margin ; and to be delivered,
subject to the exceptions and conditions hereinafter mentioned, in the like good
order and condition from the ship's tackles (where the ship's responsibility shall
cease), at the aforesaid port of or so near thereto as she may safely
get, unto or to his or their assigns. Freight for the said goods and
primage (if any) to be paid by the shippers in on delivery of the bills of
lading, in cash without deduction, ship lost or not lost. Average as accustomed.

The following are the exceptions and conditions above referred to :—

Weight, measure, quality, contents, and value unknown.

The act of GOD ; the Queen's enemies ; pirates ; robbers by land or sea ;
restraint of princes, rulers, or people ; loss or damage from machinery, boilers, or
steam, or from explosion, heat, or fire on board, in hulk or craft, or on shore ;
jettison ; barratry ; any act, neglect, or default whatsoever of pilots, master, or
crew in the management or navigation of the ship ; and all and every the dangers
and accidents of the seas, rivers, and canal, and of navigation of whatever nature
or kind are excepted.

The ship is not liable for insufficient packing, or reasonable wear and tear of
packages ; for inaccuracies, obliteration or absence of marks, numbers, address, or
description of goods shipped ; leakage ; breakage ; loss or damage by dust from
coaling on the voyage ; sweat ; rust ; decay. Fines and expenses, and losses by
detention of ship or cargo, caused by incorrect marking, or by incomplete or in-
correct description of contents or weight, or of any other particulars required by
the authorities at the port of discharge, upon either the packages or bills of lading,
shall be borne by the owners of the goods.

The steamer, while detained at any port for the purpose of coaling, is at
liberty to discharge and receive goods and passengers.

The owners of this steamer will not be accountable for gold, silver, bullion,
specie, jewellery, precious stones, or precious metals, or beyond the amount of
£100 for any one package, unless the bills of lading are signed for such goods,
and the value declared therein.

If medicinal fluids, or any other goods of an inflammable, damaging, or dangerous nature are shipped without being previously declared and arranged for, they are liable upon discovery to be thrown overboard, and the loss will fall upon the shippers or owners of such fluids or goods.

The goods are to be discharged from the ship as soon as public intimation is given that she is ready to unload, and if not thereupon removed without delay by the consignee, the master or agent is to be at liberty to land the same, or, if necessary, to discharge into hulk, lazaretto, or hired lighters, at the risk and expense of the owners of the goods.

In case of quarantine, the goods may be discharged into quarantine depôt, hulk, or other vessel, as required for the ship's despatch. Quarantine expenses upon the goods, of whatever nature or kind, shall be borne by the owners of the goods.

In case of the blockade or interdict of the port of discharge, or if the entering of or discharging in the port shall be considered by the master unsafe by reason of war or disturbances, the master may land the goods at the nearest safe and convenient port, at the expense and risk of the owners of the goods; and the ship's responsibility shall cease when the goods are so discharged into proper and safe keeping, the master giving immediate notice of the same to the consignees of the goods, so far as they can be ascertained.

The master or agent shall have a lien on the goods for payments made or liabilities incurred in respect of any charges stipulated herein to be borne by the owners of the goods.

In case any part of the within goods cannot be found during the ship's stay at the port of destination, they are when found to be sent back by first steamer at the ship's risk and expense, and subject to any proved claim for loss of market.

If prevented from discharging by weather, the goods may be taken on to the next convenient port for transhipment to their destination at the expense of the vessel, but at the risk of the merchant.

The ship shall not be liable for incorrect delivery unless each package shall have been distinctly marked by the shippers before shipment with the name of the port of destination.

In witness whereof, the master or agent of the said ship has signed bills of lading, exclusive of the master's copy, all of this tenor and date, one of which being accomplished the others to stand void

Dated at 18

59. BIMLIPÁTAM. Capt. BAWDEN (see mirabolines) says:—
 "I have put an anna per ton as the only **port charge** at Bimlipatam, which I think is correct; at any rate the tonnage dues are half those at Madras. Bass's light dues, if not paid at the previous port. There is no harbour, so that **pilots** are unnecessary, the coast being quite safe to approach by the lead; anchorage good all the way up. Hospital dues, optional to pay so much during the ship's stay, or a large fee of two guineas for a visit. Lime juice certificate, showing that there is a certain quantity on board properly fortified, 10s. Except groceries, ship's stores are not procurable; beef or mutton 2d. & lb.; water very good, but expensive. Bamboo dunnage very expensive; mats are cheap."

60. **BITUMEN**, from the Latin of "bitumen" and French "bitume," signifying pitch. The word, as now employed, comprises a wide range of inflammable mineral and tarry substances, burning with flame in the open air; these substances are either fluid or solid. Amongst the fluid are naptha or petroleum—an oily bitumen found dropping from rocks, and from which naptha is occasionally distilled. Amongst the solids are asphaltum or mineral pitch, and a white substance called mineral tallow; these substances appear to have resulted from the decomposition of wood or coal, by heat or other action, under the surface of the earth; their ultimate constituents are for the most part carbon and hydrogen; see asphalte, coal, naptha, and petroleum. When Mediterranean wheat is freighted at 1s. $\frac{1}{2}$ quarter, bitumen is rated at 4s. 8d. $\frac{1}{2}$ ton of 20 cwt.

61. **BLACK LEAD**, or **PLUMBAGO**, requires to be well dunnaged, for if leakage comes in contact with black lead, great damage may be done to other goods. Care should be taken, when rolling about casks in the hold, that the contents do not fall among sugar, rice, &c., which it will spoil. If black lead and oil are placed near each other, the oil will be wasted, and spontaneous combustion may be produced. When black lead is shipped as dunnage, which is not recommended, the same should be specified on the bill of lading. At Ceylon the tare is very great; agree for gross weight, if possible. At Colombo black lead is usually packed in fragile flour barrels. At Bombay 20 cwt. go to a ton; a cask weighs about 11 $\frac{1}{2}$ cwt. The specific gravity of black lead varies from 1.987 to 2.400.

62. **BLACKWOOD** is usually in pieces of irregular shapes, about three feet long by two inches thick. In the East Indies and in the Mauritius, it is frequently taken as dunnage. Bombay ton for freight, 50 cubic feet in square straight logs, but if otherwise, 20 cwt.

63. **BLEACHING POWDER** is chloride of lime made by exposing slaked lime to the action of chlorine; it is used for bleaching linens, calicoes, and paper materials; this article is of a corrosive and dangerous description, and will therefore injure other goods by contact; see chloride of lime and dangerous goods. Bleaching powder is usually packed in casks containing 5 cwt. each, four of which go to a ton for freight.

64. **Law Case.** In the Court of Queen's Bench, 14th December, 1857, before Lord CAMPBELL and a special jury, *BRASS v. MAITLAND*. The declaration alleged that defendant shipped on board the *Regina* a quantity of chloride of lime, insufficiently packed, and without giving notice of its dangerous qualities, and that a large portion of the rest of the cargo was injured by the gases which escaped therefrom.

The *Regina* was a general ship, bound to Calcutta; defendant engaged freight for 60 casks of bleaching powder, or chloride of lime; the casks were stowed between decks along the sides; next them crates of glass, and in the centre a quantity of bale goods. On the voyage great annoyance was experienced from gas, and when the hatches were opened it was found that by the action of the chlorine, gas evolved from the bleaching powder, the casks in which it was were completely eaten away, and the piece-goods totally deprived of their colour. Plaintiff, in consequence, paid £933 17s. 2d., and now sought to recover same, founding his claim on the legal obligation attaching on all shippers of dangerous or destructive goods, to give notice of their quality or nature, unless they are of such a description as that it may reasonably be supposed that the shipowners and their agents are cognizant of their character. Plaintiff's case was, that neither he nor the master were aware of the dangerous quality of the article, which was merely shipped as bleaching powder; and several witnesses stated that the casks were not of the peculiar character in which such an article ought to be packed for so long a voyage.

The defence was that bleaching powder was a well-known article of commerce, and well known to be composed of chloride of lime, so that the plaintiff and the master must have been aware of its character; that the casks in question were of particularly good description, purposely prepared; that the dry goods ought not to have been stowed so near; and that the casks should have been placed in the bottom of the hold instead of in the wings, where they were wetted by droppings from the seams of the deck, which were strained by heavy weather, and the effects of a collision with another vessel early in the voyage.

The jury found that the casks were of the proper kind but not properly stowed, and that the injury to the bale goods arose therefrom, and that the plaintiff's broker and master might, and reasonably ought, to have known the nature of bleaching powder.—Verdict for defendant, with leave to move.

In March, 1858, the subject was re-considered, when the Court held (Mr. Justice CROMPTON dissenting), that shippers of dangerous goods are bound to intimate their nature to the master at time of shipment; but that, the goods having been delivered as casks of bleaching powder, which the master reasonably might have known to contain or consist of chloride of lime, no notice was necessary. Mr. Justice CROMPTON observed that the master is not the person generally concerned in the shipping of goods; he only acts in signing bills of lading upon the mate's receipts, &c.

65. BONES. Ground bones are so very dry that if insufficient dunnage is used, the heat will crack the ceiling and open the seams. In passenger ships from Victoria, boiled shin bones, "whites," are allowed to be carried; most other sorts are refused by the colonial legislature there. What are termed "yellows," unboiled, emit a noisome effluvia, likely to injure certain goods in a general cargo. It is difficult to estimate the weight of uncrushed bones, so much depends on their structure, size, &c. A bushel of crushed South American heavy cattle bones weighs about 56 lbs.; Russian and Mediterranean light cattle and mixed, 42 lbs.; and Belgian fine and coarse mixed, steamed, 60 lbs. Of Belgian, in 1864, the *Only Son*, Capt. BLANCHARD,

stowed 110 tons 19 cwt.; her full cargo of coal was 115 tons; see hides.

66. Boiled. In the Second Court, London, 19th December, 1860. *HUNT v. GREEVES*. This was an action brought for £308 5s. 7d., balance due on three cargoes of bones shipped from Colchester. The main question turned on the nature of the contract, defendant insisting that it was confined to a particular parcel of bones, about 150 tons, which were lying at Colchester, and plaintiff contending that he was entitled to payment, although the cargoes in question were made up partly of those bones, and partly of others. The contract described the bones to be "English boiled bones, very dry and light." The first cargo arrived at Stockwith, the nearest port to Doncaster, and was paid for, and nothing turned upon that; in the second, having heated on the voyage, the bones were reduced in weight 8 tons 7 cwt. out of 74 tons 17 cwt. Plaintiff admitted, on cross-examination, that this was an unusually great reduction, and that the bones purchased and mixed with those lying at Colchester were not of so good a description, and that the tendency of mixing these inferior bones with the others was to cause the heating of the whole. In the third cargo the reduction was found to be 4 tons 2 cwt. out of 42 tons 3 cwt. At the close of the evidence, plaintiff's counsel claimed a verdict for so much of the cargoes as consisted of the parcel lying at Colchester, but defendant's counsel urged that it was impossible to separate the one sort from the other, and, therefore, that they were entitled to reject the whole of both cargoes. The judge ruled in favour of defendants, and plaintiff was nonsuited.

Tonnage. 8 tons calcined, 12 manure, &c., or 16 best quality, all in bulk, will occupy 850 cubic feet or 1 keel. At Bahia 12 cwt. go to a ton. When wheat is freighted at 1s. $\frac{7}{8}$ quarter, calcined bones are rated at 12s. 1 $\frac{1}{2}$ d., manure 8s. 1d., bones in bulk 8s., and the best quality 6s. 0 $\frac{3}{4}$ d. $\frac{7}{8}$ ton.

67. BONE ASH. See ashes and charcoal.

68. BOOKS. One extensive London publisher generally uses for exportation to America, strong deal cases, hooped with iron, 3 feet long, 1 $\frac{1}{2}$ wide, and 1 $\frac{1}{2}$ deep, inside measurement; they weigh 45 lbs., and hold 250 lbs. weight of books. Books in boards, not being so heavy, may occasionally be packed in larger cases, but cases containing 30 cubic feet have been found inconveniently large. For the Overland Routes they are necessarily small. For **Australia** and other long voyages the cases are lined with tin, to preserve the contents and to reduce the rate of insurance; consignees at the Cape of Good Hope, and in other parts, prefer zinc, being more convertible than tin. Felt, which is lighter than either, is used for some consignments. Preference for stowage is given to the upper part of the main hold, amidships, where the cases will keep dry, and the books be free from the jars and concussions of the bow and stern; the trade prefer having them near the hatchways, to secure early delivery. The cubical contents and weights of various religious books will be found in the table of Marine Necessaries at the beginning of this

work ; see stationery ; 40 cubic feet generally go to a ton freight ; Bengal, Madras, and Bombay ton 50 cubic feet.

69. **BOOTS AND SHOES** ; in trunks and cases, 40 feet to a ton.

70. **BORATE OF LIME**. Large quantities in bags of a quintal each, 102 lbs., are shipped all the year round at **Iquique**. It is much lighter than coal, and little over half the weight of nitrate of soda. It is not so susceptible of injury by dampness as nitrate, on which it is usually stowed, but requires to be sufficiently dunnaged. Both these articles are shipped also at Mexilones and Pisagua.

71. **BORAX (Tincal)** the biborate of soda, a salt of a brownish grey colour and a sweetish taste. Borax is tincal in a refined state ; both are produced in Thibet, and are shipped at Calcutta and Bombay. The specific gravity of borax is 1.714 ; it is packed in cases 3 to 4 cwt. each ; tincal in casks from 6 to 7 cwt. each. Bengal, Madras, and Bombay ton 20 cwt. ; Madras and Bombay 50 cubic feet in cases.

72. **BOTTOMRY AND RESPONDENTIA** is a mortgage of the ship. The owner or master is, under certain circumstances, authorized to borrow money for outfit, or to purchase cargo for the voyage, pledging the keel or bottom (a part for the whole) in security for payment. In bottomry contracts it is stipulated that if the ship be lost in the course of the voyage, the lender shall lose his whole money ; but if she arrives in safety, the lender is then entitled to get back his principal and the agreed interest, however much it exceeds the legal rate ; the extra hazard run by the lender has been held to justify his securing the highest rate of interest. Respondentia means money lent on cargo. The last of two or more bottomry bonds is first paid. When a laden vessel puts into an intermediate port for repairs, the master can bottomree ship, cargo, and freight, to raise money to pay for it. An English vessel cannot legally be bottomreed in England. Money for bottomry should be advertised for, and the lowest offer accepted.

73. **BOXWOOD**. Specific gravity of Dutch is 1.3280. When Mediterranean wheat is freighted at 1s. 4 quarter, boxwood is rated at 4s. 8d. 4 ton. of 20 cwt.

74. **BRAN**. The Admiralty allows 48 bushels of bran or of pollard to a ton. In the Australian colonies the bushel is taken at 20 lbs.,—the ton being 2,000 lbs. ; freight in proportion. At the Cape of Good Hope 1,200 lbs. is the standard ton for freight ; sometimes 1,400 lbs. are taken.

75. BRAZIL NUTS, the fruit of the *Junia*, which abounds on the Orinoco and in the Brazils ; see nuts.

76. BRAZIL WOOD, for dying is plentiful at Pernambuco.

77. BREAD. Every particle of aqueous matter, without injury to it, is dried out of ship biscuit in the oven, and afterwards on kilns, &c., if properly manufactured, and it is thus rendered one-tenth lighter than the flour from which it was made ; being so dry it will attract water in an extraordinary manner, and when once damp, decomposition spreads rapidly. If not kiln-dried, which is objectionable, some days should elapse after baking, to allow the oven-steam to be well evaporated. Bread should not be shipped in wet weather, especially in bags, which quickly imbibe dampness, retain it, and communicate it to every bag near. If stowed in a clean lime-washed iron tank, and the lid made air-tight, it will keep good for years.

78. When loading with government provisions, it is customary to ballast with a sufficient quantity of beef and pork ; dunnage with slabs over the casks, and at least four inches from the sides ; fill up to the deck and stow close, to prevent the bags from chafing. Another authority says : " bread as cargo should be the last article put into the ship, the sides of which should have thin boards, nailed upon good matting, fitted against them, and a casing should go round the masts, pumps, &c."

79. At **Hamburg**, some merchants nail inch boards against the sides, weather-board fashion. An experienced master recommends, that when loading all bread at that port, for Labrador, the ballast should be well dunnaged, not with straw or reed, which rots when wetted, but brushwood or broom stuff, &c. ; for the sides, feather-edge clap board, $\frac{3}{4}$ -inch by 7, or $\frac{3}{4}$ or $\frac{1}{2}$ -inch board the same width, which will sell for its cost. When there is space over the top tier, lay straw to catch loose drops from the seams of the deck.

80. Care should be taken not to stow bread on or near cordage, turpentine, or tar, coal tar especially ; the ship's ceiling sometimes gets a coat of coal tar, but this ought to be avoided previous to loading bread, which should not go into a hold just cleared from a cargo of salt. The scent from camphor will make bread unfit for human consumption. Bags containing bread stowed on bricks in England, have become so rotten during the passage to Newfoundland, that the bottoms have fallen out.

81. Manufacturers object strongly to the stowage of bread for *ship's use*, in bags, and recommend casks, or iron, with the inside tinned, or tinned cases, doubled, with highly-dried saw-dust, almost

charred, between, and made to fit the shape of the ship. An experienced master objects to iron, on account of its liability to rust when bulk is broken, unless the case is emptied at once, and recommends air-tight rum puncheons, which contain from $3\frac{1}{4}$ to 4 cwt. each; these are not used by some, because the bread becomes impregnated with the taste of rum; they prefer good charred air-tight casks. All unite in recommending bread to be kept perfectly dry. One master suggests that on long voyages, it should be stowed in the coolest locality, to lessen the attack of weevil and mite, and that store biscuit, so generally kept aft, ought to be stowed forward. Another says: that when conveying troops to Australia, their bread, in bags, continued sweet, because it was all stowed together in a suitable place, while that of the crew became damaged, the casks having been placed promiscuously with those containing water, beer, provisions, &c.; see the articles bricks, general cargo, passengers, &c.

Tonnage. 120 bags bread, 112 lbs. each, 6 tons, will occupy a space of 850 cubic feet or 1 keel. The Admiralty allows 7 bags of 112 lbs. net, in bags, and 5 bags in casks, to a ton; some Admiralty bread casks are 3 feet 8 inches long, bilge 3 feet, and contains 6 bags, equal to $1\frac{1}{4}$ tons for freight. The Admiralty compute a ton of bread in bulk, for naval purposes, to measure 124 cubic feet; packed 110 feet; a bag 6 cubic feet,—gross weight 114 lbs., bag 2 lbs., net 112 lbs. At New York 6 cwt. in casks, 7 in bags, and 8 in bulk, is allowed to a ton. At Baltimore 800 lbs. ship bread in bags, 700 in casks. When wheat is 1s. $\frac{7}{8}$ quarter freight, bread should be 9 $\frac{3}{4}$ d. $\frac{7}{8}$ bag.

For the purpose of *changing stocks* in bond, the 5th and 6th Vic., cap. 92, proportioned for every 96 lbs. of kiln-dried wheat, or for every 100 lbs. of wheat not being kiln-dried, not less than 78 lbs. of fine wheat flour, or 68 lbs. of captain's biscuit, or 80 lbs. of biscuit of the standard of the biscuit supplied to H.M. Navy, or 118 lbs. common ship biscuit. The Admiralty allows 500 *biscuit bags*, pressed, 700 half-bags, or 200 meal sacks to a ton for freight.

82. BRICKS are a most dangerous cargo in a leaky vessel, for should they come in contact with water, their power of absorption is so great, that a vessel deeply laden would be liable to foundering from the increased weight of her cargo—an ordinary brick will absorb 1 lb. of water. In London it is usual to purchase bricks to be shipped free on board; they are consequently stowed in the hold, in tiers, by men accustomed to it; a large quantity should be placed in the middle if possible. A ship cannot carry a full lading. Bricks will readily absorb one-fifteenth of their weight in water. They are liable to be damaged by sea-water, and should have sufficient dunnage. From Hamburg to Labrador, it is usual to take with the bread and provisions, a few thousand bricks for ballast; they should be as dry as possible, otherwise the heat of the hold will cause them to steam, which, coming in contact with the cold decks and sides, will especi-

ally if they are varnished, condense and fall in drops, or run down, and damage the bread. It is desirable to have a ground tier of barrels of pork and beef and flour, with firkins of butter for broken stowage, which will keep the bread off from the bricks.

Tonnage. 7,000 fire bricks, or 8,000 common bricks, also tiles, weigh 21 tons and measure 638 cubic feet or three-quarters of a keel.

Sizes. One unburnt London brick is 10 inches long and 5 broad; a burnt brick is 9 inches long $4\frac{1}{2}$ wide, and $2\frac{1}{2}$ thick, and weighs about 4 lbs. 15 ozs. 450 stock bricks weigh 1 ton, and there are 500 in a load; 1,000 London stock bricks weigh about $2\frac{1}{2}$ tons; 1,000 Jersey bricks $2\frac{1}{2}$; and 1,000 Fareham, Southampton, &c., 3 tons. 1,000 fire bricks weigh $3\frac{1}{2}$ to 4 tons. A Glasgow fire brick is $9\frac{1}{2}$ inches long, $4\frac{1}{2}$ broad, and 3 thick, and weighs $8\frac{1}{2}$ lbs. Some are 9 inches long, $4\frac{1}{2}$ broad, by $1\frac{1}{2}$ thick.

83. BRIMSTONE requires say 6 inches dunnage in the flat, and 9 in the bilge. When stowed in bulk it should be kept as high as possible; as it falls into the hold there let it lie, excepting the necessary trimming off to prevent shifting, and thus avoid labouring and straining at sea. A full cargo cannot be taken, say a little over three-fourths. Empty casks are sometimes placed below to keep the cargo up; if they are broken by the rolling of the ship at sea, very great danger is to be apprehended. Brimstone and sulphur are greatly damaged by contact with oil, which they will attract from casks. A small quantity of oil will spoil a full cargo of brimstone intended for bleaching purposes. In general cargoes it should be kept as far as possible from saltpetre, nitrate of soda, charcoal, and all goods liable to spontaneous combustion, for should fire break out and communicate with the brimstone, its suffocating vapours may prevent all efforts to extinguish it. Igniting lucifer matches where brimstone may have penetrated, and smoking tobacco below, are highly dangerous. Flour brimstone is usually packed in barrels. Rolled brimstone is generally exported from Italy in cases of 3 cwt. each; see sulphur. Brimstone is shipped all the year round. Bengal and Madras ton 20 cwt. When Mediterranean wheat is freighted at 1s. $\frac{1}{4}$ quarter, sulphur is rated at 4s. 8d. $\frac{1}{4}$ ton of 20 cwt.

84. BRISTLES, the strong hairs which grow along the spine of the hog and wild boar. Baltic bristles receive two-thirds freight of clean hemp $\frac{1}{4}$ ton of 44 poods gross. A cask weighs 10 cwt.

85. BUFFALO HORNS. 16 cwt. go to a ton at Bombay.

86. BUTTER should be stowed as low down as possible, for the sake of coolness; it will not, however, bear much pressure. It is exported from Ireland and Holland all the year round; quantities

are exported from Hamburg, France, Canada and America. Large quantities are exported from Gijon in Spain, chiefly in casks say 133 lbs. gross. The casks are so strong that four and even five heights can be stacked safely. Spanish butters are always computed by measurement for freight.

Tonnage. 530 firkins butter, 70 lbs. each, 16½ tons, will occupy a space of 850 cubic feet or 1 keel. In Ireland it is generally packed in firkins, but in Belfast a fresher quality is packed in crocks; for freight 32 firkins are reckoned to a ton—55 on an average weigh 2 tons. In computing the freight of kegs of butter at Baltimore, 200 lbs. net weight are considered equal to a barrel of 5 cubic feet. When wheat is 1s. 4d. quarter freight, butter is rated at 1½d. per firkin.

Measures. A firkin of English weighs 56 lbs., Irish about ¾-cwt., tare 14 lbs. net weight about 70 lbs., a tub 84 lbs., a barrel 2 cwt., a Dutch cask 1 cwt., Danish last 224 lbs., Bremerhaven ton, great measure 300 lbs., small 220.

87. **CAKE LAC** is a gum collected all over India, and is usually packed in gunny bags weighing 100 lbs. each net; see lack. Bengal and Madras ton 16 cwt. in bags.

88. **CALEDONIAN CANAL.** A Belfast merchant writing to the *Shipping Gazette*, 1st December, 1866, complains that his vessel 128 tons, from the Baltic, passing through this canal, was charged as follows:—

	£	s.	d.
Canal dues, 100 tons 1s. 6d., 40 tons 1s. ...	9	10	0
Cash advanced to pay towage	9	0	0
East Coast pilot	4	0	0
Canal pilot, sea to sea, and Sound of Islay	1	10	0
Bank expenses, postages, &c.	1	2	6
Cash to master	5	0	0
	<hr/>		
	£37	2	6

The editor says: "it is customary, unless otherwise expressed in the charter-party, for the owners to pay charges on vessel and merchant on cargo. First item on weight, to merchant; three next, to ship; fifth, it would be fair to divide; the last requires further explanation. If, however, the charter stipulated for passage through the canal at the charge of the consignee, the only amount to be paid by the ship would be the East Coast pilotage."

89. The superintendent of the canal when writing to the *Shipping Gazette*, 10th December, 1866, says: "two communications have recently appeared in your journal, which seem capable of conveying an erroneous impression of the charges incident to the passage of vessels through this canal. The latest refers to a vessel of 281 tons register, having a grain cargo of 400 tons dead-weight, on which the

canal dues for ship and cargo together would amount to £22 10s.; and for cargoes of inferior value the dues would be somewhat less. Any other charges that may be incurred are optional on the part of the master; but in most cases it is deemed expedient to incur them in a greater or less degree for the advantage of all concerned. When the winds are favourable, the expense of steam towage is saved, and the most that can be incurred for steam towage and horse trackage in calms, or against contrary winds, all through, would in the case referred to, be £14 1s., being rated on the register tonnage and limited to 1s. $\frac{1}{2}$ ton. Pilotage so far as within the jurisdiction of the canal is restricted to very moderate rates; but beyond that range, if required at all, it may be more or less in amount according to the master's general knowledge of the route he is taking, with or without the aid of the correct Admiralty charts now available. So far as an Act of Parliament can bind parties (although in this matter it has sometimes proved inoperative), the apportionment of the dues, &c., between the owners of ship and cargo is fixed by the tariff of canal charges. In the case of valuable cargoes two-thirds are payable by the cargo. This is reasonable, on the ground that the cargo is mainly the cause of the vessel making the passage; but as the ship is at least as much interested in its speedy despatch, the charges for steam towage (with which ought to be included horse trackage and pilotage) are made equally divisible between them. A further reason for giving the larger proportion of the dues to the cargo, is that the owners or consignees effect a saving of insurance, which is very considerable during the winter season, by the adoption of the canal passage; whereas the ship, being protected merely by its general or annual policy, obtains no such direct or special advantage. In the case of valuable cargoes (linseed for instance) the saving of insurance alone is probably sufficient to cover the whole charges incurred by the passage through the canal, ship and cargo together. When the master of a vessel comes unprovided with cash to meet the payment of dues or other charges, and requires to draw upon his broker or consignee, it being uncertain what some of those charges may be before the passage is completed, the amount is usually made ample to cover all contingencies, and frequently includes a sum in advance for ship's use, provisions, &c. Of course the whole amount of such draft falls, in the first instance, to be deducted from freight, but is by no means to be taken as a fair criterion of what the actual charges of the passage through the canal may have been. These ought to be separately adjusted by the production of details." [The table of the tonnage dues on canals is at the commencement of this work.]

90. CAMBOGEUM. E.I.Co.'s ton 20 cwt.

91. CAMPHINE, a popular name for essential resinous oils, such as the purified oil or distilled spirits of turpentine. When intended for a burning fluid it is mixed with alcohol in various proportions. It readily impregnates many articles with its peculiarly strong odour; when spilled in a railway van scarcely anything could be placed in it afterwards, for although the camphine had been apparently removed, yet on the change of atmosphere, the offensive effluvia was again produced. This will show the great necessity for guarding against its injurious properties on board ship; see turpentine. Creosote, which is equally injurious, is an oxyhydro-carburet, prepared from pyroxilic oil. This dangerous article should only be drawn off by daylight, no naked light should be allowed to come near it.

92. CAMPHOR is produced by several plants, particularly *Dryobalanops Camphora*, the camphor tree of Sumatra and Japan. The kind mostly found in commerce is derived from the *Laurus Camphora* or camphor laurel of Formosa, carried thence to Canton, which supplies the markets of the world. The camphor exists naturally within the tree ready formed; on splitting the wood it is found in masses 12 to 18 inches long, between the bark and the stem, and in the pith. Every *Laurus Camphora* contains camphor, which is extracted by boiling the branches, when chopped, in water. The camphor rises to the surface and becomes solid as the water cools; in some instances, the boiler in which the operation is conducted is covered with an earthen dome lined with rice straw, to which the camphor attaches itself as it rises with the steam when the water boils; it is afterwards picked off and packed. At Canton it is in chests, drums, and casks. It is sometimes packed in slight wooden cases, say 3 feet long by 18 inches square, lined with tin, which when not well soldered permit the scent to escape, much to the deterioration of coffee, cinnamon, cassia, tea, rice, and other delicate articles. At some ports camphor is packed in cases of 3 cwt. each, rather larger and stouter but of the same material as tea chests; papered, oiled, and marked; the lead of the inner case is stouter. It is rammed in hard, as much fresh water is poured in as it will absorb, and then the lead is soldered on. One package in the hold will spoil a whole cargo of tea, and bread stowed near becomes quite unpalatable; it is usually stowed on deck each side of the house, and on the main hatch; sometimes a box or two is placed on the tops. Camphor is frequently carried in poop cabins; it is often stipulated

in the bills of lading "to be carried in poop cabins." Very little, comparatively speaking, goes to England, but large quantities to America.

Freight. Bengal, Madras, and Bombay ton 50 cubic feet in cases. Chinese camphor is packed in boxes, a pecul in each, measuring 4'640 feet, 12 of which and 1'232 feet go to a ton of 50 cubic feet. A case of Chinese camphor, containing 1 pecul, measures 4'112 feet. A box weighs about 1 cwt.

93. CAMWOOD is principally obtained from the vicinity of Sierra Leone, and, being extremely dry, should not be stowed near palm oil, which it will draw through the casks, to its own injury.

94. CANDLES should be stowed in a cold dry part of the hold, and the boxes carefully placed on their bottoms, or the candles will be broken. When packing for warm climates, paper ought to be placed between each layer. For conveyance coastwise, they are usually packed 12 dozen lbs. in a box; for the navy in boxes containing 56 and 112 lbs.; for the North American colonies 50 lbs.

95. For the **home trade**, PRICE's Patent Composite are usually parcelled in paper wrappers, 6 lbs. each, and packed in corded boxes, containing from one to sixteen dozens of pounds, the candles in the packages being protected by a small quantity of straw, where any vacant space occurs, and a layer at the top. For shipments to some of the outports, hogsheads and puncheons are occasionally used, the small-sized paper parcels, and mode of filling with straw, being observed, as when packing in boxes. For **exportation**, small cases, containing 25 to 28 lbs. each are substituted, the candles being wrapped in 6-lb. parcels. For the East Indian market they are usually placed in single pound papers as being more eligible for sale there; these cases do not require any straw, as they are made to fit the bulk of the packets as closely as practicable; for the West Indies, puncheons, and hogsheads, as well as small cases, are used. To compete with the packets which are imported into those markets by foreign makers, and which represents the English pound packets, but contain 14 oz. only avoirdupois, the Company put up their Belmont Sperm Candles in packets of two sizes, containing 12 and 16 ozs. net weight, English avoirdupois, which packets bear a label stating their weight and contents. Twenty-five of these 16-oz. packets would pack in a case of nearly the same cubical dimensions as the 25-lb. cases referred to. PRICE's candles, made expressly for the export trade, require little care for choice of place for stowage; from their hardness they are not affected by increase of temperature, when placed in the upper tier of a cargo.

Freight. The Admiralty allows 100 dozen to the ton. In computing the freight of boxes of candles at Baltimore, 200 lbs. net are considered equal to a barrel of 5 cubic feet.

96. **CANELLA ALBA**, the inner bark of a tree growing in the West Indies, exported in casks and cases, in long pieces, some rolled in quills and others flat; the quilled is considerably thicker than cinnamon, and the flat nearly a quarter of an inch thick. The quilled is yellow both sides, the flat is yellow outside and pale brown within.

97. **CANES** are usually shipped in India for broken stowage; the bundles are of various sizes and are frequently unfastened when stowing, much to the objection of the consignees on delivery. 3,000 (16 cwt.) go to a ton at Bombay.

98. **CANTHARIDES** or **SPANISH FLY**, an insect found on a variety of shrubs in Spain, Italy, France, &c.: those used in Great Britain are imported partly from Sicily, but principally from Astracan, packed in casks and small chests; they have a very powerful and nauseous scent, and should be kept from the air.

99. **CANTON MATTING** is shipped all the year round, chiefly at Whampoa. It is in bales and rolls varying in length from two to six feet, and averaging 56 lbs. in weight. It is usually brought to Europe in the 'tween decks, amidships, clear of iron beams, stanchions, and ties, and in stowing should be treated like bale goods. By proximity, Canton matting will injure preserved ginger in cases. It is frequently brought in tea ships; see the *Grasmere*, in the article tea. A ton for freight 50 cubic feet; the rates of freight varying.

CANTON MATTING—MEASUREMENT FOR FREIGHT.

Size of roll.	Yards.	Measurement.	Packages in a ton.	
		Cubic feet.	40 feet.	50 feet.
$\frac{3}{4}$	40	3'6	11	14
$\frac{1}{2}$	—	4'8	8 $\frac{1}{2}$	10'4
$\frac{1}{4}$	—	6'0	6 $\frac{3}{4}$	8 $\frac{1}{2}$
$\frac{1}{8}$	—	7'2	5'6	7

100. **CANVAS** must be kept free from oils, liquids, moist goods, or dampness of any kind, as it is liable to mildew; salt-water stains it and injures its appearance. **Sailcloth** should also be kept off from metals of all descriptions, or iron-bound packages and casks, which will chafe it, and the iron-moulds will cause it to rot; see vermin. **Sails** for exportation are usually stowed in casks.

Freight. For freight 60 pieces Baltic sail-cloth, are equal to two-thirds of a ton of clean hemp.

Bolts. The length of a piece or bolt of British sail-cloth, as required by law, is 38 yards; breadth 24 inches. Every piece or bolt 24 inches wide should contain at least 560 double threads of yarn.

Weight. *Double threads*, No. 1, 44 lbs.; 2, 41; 3, 38; 4, 35; 5, 32; and 6, 29 lbs. *Single threads*, No. 7, 24 lbs; 8, 21; 9, 18; and 10, 15 lbs.

101. **CARDAMOMS** (seed capsules), are usually in boxes weighing 100 lbs. each, they are convenient for stowing, but must not be placed over saltpetre. Bengal ton 8 cwt. in robbins, 50 cubic feet in boxes; Madras ton 8 cwt. in robbins, 50 cubic feet in boxes, 10 cwt. in bags; Bombay ton 50 cubic feet in boxes.

102. **CASHEW NUTS** (anacardium) are externally of a greyish or brownish colour, kidney-shaped, somewhat convex on one side and depressed on the other; the shell is hard and between it and the kernel there is lodged a thick blackish inflammable oil, very caustic in fresh nuts.

103. **CASKS.** In hoisting all casks, such as hogsheads, puncheons, pipes and butts, containing spirits, oil, or any other valuable liquid, use chain or rope slings, if possible, and not can-hooks. In stowing let them be carefully bedded and quoined, use the slice in preference to the crow-bar; see that the bung-holes are all up, bilge free and heads clear. The beds should be thick enough to keep the bilge clear when placed near the heads, commonly called the quarters, which is their proper position, being the strongest part of the cask. Let the chimes meet so that the chime of one cask shall not work into the head of the next. Sometimes leakage in the lower tier cannot be discovered when the upper pressure is removed, as the staves close in again. Casks often leak for want of sufficient rush round the heading. When placed in a dry position, after exposure to rain or a damp atmosphere, the hoops are liable to start, and the casks will require inspection. In some trades the same casks are used voyage after voyage, and are lime-washed every time, until they are covered with a crust which conceals the condition of the staves, hoops, and heads; before shipping these, masters should have them scraped and surveyed, to avoid leakage and waste, and prevent disputes and loss of freight at the port of discharge. BRADY says: "strike down the beds of casks, place and whitewash them: commence stowing in the after bulkhead in the hold, the largest casks in the keelson tier, and the guages on each side to correspond. After completing the first tier go on with the second, placing hanging beds

between the casks, and stowing bark wood in all the breakages ; as the tiers approach the wings, let the size of the casks diminish ; " see general cargo, hanging beds, wines, oils, &c. Casks are said to be stowed *a-burton* when they are stowed athwarts. *To up-end a large cask* : lay a capstan bar under the bilge on each side, span them together under the chimes at each end ; man the bars, and up with it sticking to it on the opposite side to prevent the casks going over.

SUNDRY CASKS.				ADMIRALTY CASKS.			
	Length.	Breadth.	Contents.		Length.	Diam.	Cont.
	ft. in.	ft. in.	gal.		in.	in.	in.
Port pipe ...	4 10	2 10	113, 116	Leager ...	59	38	164
Do. hhd. ...	3 1	2 6	56, 58	Butt	53	33	110
Sherry butt.	4 2	2 11	108, 112	Puncheon	41½	30	72
Do. hhd. ...	3 2	2 4	54, 56	Hogshead	37	28	54
Marsala pipe	5 5	2 8	90, 96	Barrel ...	31½	24½	36
Do. hhd. ...	3 5	2 1	45, 48	Half hhd.	28	22½	27
Brandy pipe	4 4	2 10	114, 118	Kilderkin.	25	19½	18
Do. hhd. ...	3 4	2 4	57, 59	Firkin ...	22	17	12
Rum punch.	3 6	3 0	90, 96				

104. *To calculate the capacity of a cask* : Multiply half the sum of the areas of the two interior circles, viz. : at the head and bung, by the interior length, for the contents in cubic inches ; which, divided by 277·27, the number of cubic inches in a gallon, reduces the result to that measure. Supposing that the casks at your disposal measured 21 inches in diameter at the bung, 16 inches at the head, and 28 inches in length ; then 346·4 and 201·1 would be the respective areas and their half-sum—547·5, multiplied by 28, and divided by 277·27, would give 27·65 gallons for the contents, which is the capacity of a beef-barrel. The bulk of a barrel (for freight) is taken as 5 cubic feet, 8 barrels being 40 cubic feet or one ton bulk ; the general rule for finding the content for stowage of a cask is to multiply the bilge diameter by itself, and the product by the length ; from the result subtract one-fifth of itself : the remainder is the content of the cask.

For the government rates of freight for casks, staves, headings, packs, hoops, &c., see Admiralty tables at the commencement of this work, where they are set forth very elaborately.

105. CASSIA is made up in cases 4 feet long by 18 inches and 15 inches, and is extremely light, so much so as to cause very little immersion of a ship when fully laden with it. In China, granite is

available and well adapted for ballast, when bound to Singapore; worked granite for window cills, door steps, &c., may be found profitable. Cassia from Malabar is thicker and darker than that of China, and more subject to foul packing; each bundle should, if possible, be inspected separately. Cassia, with other drugs, is usually shipped for England in what are termed drug ships.

Tonnage. Bengal, Madras, and Bombay ton 50 cubic feet. At Calcutta a ton in cases weighs about 5 cwt., and measures 50 cubic feet; when taken at 10 cwt., which is sometimes done, the rate of freight should be increased in proportion; Singapore should be taken at 50 cubic feet. Boxes of Chinese, containing a pecul, measure 10'142 feet, of which 4 and 9'432 feet make a ton of 50 cubic feet or 7 containing half a pecul 6'950 each, and 1'35 feet; or 7 boxes containing a pecul of cassia buds, measuring 6'500 each, with 4½ feet. A case of cassia buds, containing one pecul, measures 4'688 feet. A chest of cassia usually weighs 60 lbs.

106. CATECHU, or TERRA JAPONICA, signifies in Japanese the juice of a tree. It is an extract from the *Acacia Catechu*, &c., an astringent substance of tan and extractive matter, imported chiefly from Bengal and Bombay; its principal use is in medicine. At Singapore, terra japonica or gambier is of a sticky character, and should be kept off sago, coffee, and all kinds of species. Another authority says: "cutch or terra japonica should be stowed below every article liable to damage from its soluble properties, and when practicable, it should be kept before the fore hatchway. Heat will sometimes make it adhere so closely to the hold that the labour of discharging will cost as much as the freight obtained. A rush mat between every bale, may prevent them from sticking together. In the East Indies, it is frequently shipped as dunnage, which ought to be expressed on the bill of lading; it should not be used exclusively for that purpose, for if too little dunnage is laid on, the cutch, when pressed by the weight of the cargo, will swell down between, and prevent the passage of water." It is sometimes packed in rattan baskets, holding about 1 cwt. each. At Singapore, it is packed in bales of about 1 cwt. each, covered with gunny bags and mats. In Bengal catechu is shipped principally during the north-east monsoon; gee gambier. Bengal and Madras ton 17 cwt. in unscrewed bags, Bombay ton 16 cwt. in unscrewed bags.

107. CATTLE require in the hold a level footing of ballast; their heads should be well secured to the sides by head-ropes and ring-bolts. Horse boxes, or good wide canvas belly-bands, should be used for landing, especially in stormy weather; see horses and passenger ships, in which there are some Admiralty regulations regarding the conveyance of animals. Baron ALDERSON decided,

13th January, 1855, in the Exchequer Court, *GIBSON v. STURGE*, that freight is payable only on those animals brought alive. Most of the cattle-ships that come to England are steamers fitted for the trade, that carry the cattle on 'tween decks. The small sailing vessels that carry cattle, and these having no 'tween decks, stow the water-casks fore and aft alongside the keelson, then cover over and make a level of sand and stow the cattle with heads amidship, leaving a gangway. Valuable horses are carried in boxes or stalls, and should have canvas belly-bands under them; their bands should be loose in fine weather, but should be tightened up before bad weather comes on, so that if the vessel rolls the animal rests on the support. In this manner, the valuable stock that is sent to Australia for breeding purposes make the long sailing voyage in safety.

108. CEMENT in sacks occupies about the same space, and is of the same weight as coal in bulk; in casks 60 tons to 100 tons of coal. Quantities are sent from London, in ships averaging 100 tons each, to Cherbourg, where charterers require dunnage six inches thick in the bottom and nine in the bilges. **Port charges** for a ship of 100 tons:—1 franc and double decime $\frac{1}{2}$ ton; entry 2 francs; clearance 50 centimes; passport (once yearly) 1 franc 50 centimes; bridgemen at the basin 3 francs; **pilotage** is not compulsory under 80 tons; steamers pay half pilotage.

109. CEYLON STONES are packed in small boxes which are very heavy; being valuable they should be stowed in a place of safety, so as not to tempt the crew. 20 cwt. go to a ton at Bombay.

110. CHALK shipped in 1862, at Greenhithe, for delivery in the North of England, at 1s. 9d. $\frac{1}{2}$ ton, has been accepted at Newcastle, for chemical purposes, at 1s. $\frac{1}{2}$ ton only, because it was alleged to be "small," and only "half chalk" and "half cibles;" specific gravity 1.870 to 2.657.

111. CHARCOAL. Animal Charcoal, Bone Black or Ivory Black is the product of the destructive distillation of bones, and is chiefly employed for refining raw sugars; it is in coarse grains about the size of peas; value in 1862, £13 to £15 $\frac{1}{2}$ ton. When new if dry, a cubic foot weighs 45 $\frac{1}{2}$ lbs.; a cubic foot of Newcastle coal averages 78 lbs. Welsh 86 lbs. When the power of charcoal for refining sugar is exhausted, it is termed spent charcoal or spent black, and is largely employed by the manufacturers of artificial manures. Its specific gravity is greater than that of the new charcoal—a cubic foot of it weighing 67 lbs. It is generally packed in hogsheads. The new black more commonly in bags of 1 cwt. to 1 $\frac{1}{2}$ cwt. each. Char-

coal dust produced in the manufacture of the new black is in fine powder ; it is also used by the manure manufacturers ; a cubic foot of it weighs, of old 62 lbs., of new 48 lbs. While dry, neither the new nor the spent black is considered injurious to other goods, but the black may draw moisture from the bilge-water if stowed near, or from contiguous moist goods. Freight is charged on gross weight. Care should be taken to prevent animal charcoal from choking the pumps ; it will readily absorb 20 per cent. of its own weight, and soon cause a ship to founder. When wet, bone-ash creates considerable heat and steam, and in this condition has damaged bales of hair from Rio Grande to Liverpool. Avoid the shipment of wood or peat charcoal recently made, as it is liable to spontaneous combustion, simply from access of the atmosphere in a warm moist locality, without the admixture of oil or other liquids.

112. At **Monte Video** charcoal or bone-ash is manufactured on a hill in sight of the harbour ; it is as heavy as sand, and a full lading of it cannot be conveyed. The fore and aft schooner, *Ann and Susan*, of New York, Capt. PEARSON, loaded there in January, 1862. She registers about 320 tons American, or 340 English, and took in rather more than 320 tons goods, viz. : 160 tons bone-ash, 110 tons bones, and 50 tons of the pith extracted from the inside of bullocks' horns. The bones consisted of horses' legs, bullocks' shins, and the bones of various animals, including dogs. With these a platform was laid on the ceiling 16 to 20 inches, say as high as the keelson, and a compact wall 3 feet thick, built against the sides, so that the bone-ash was completely dunnaged from the skin of the hold, to avoid injury from leakage. All the articles were stowed in bulk. Freight was reckoned at 22 cwt. 40 lbs. to the ton, all round—a rate much against the ship for the bones and pith. With this cargo she drew 11 feet forward and 12 aft, and was in good trim for sailing—rather light. With 389 tons of Cardiff coal her trim was 12½ feet forward and 13 aft. With 13,000 bushels of wheat, shipped at New York in the main hold, she drew 11 feet 8 inches forward and 12 feet 9 inches aft ; the ends were left open. The seams in her ceiling and skin were tightly closed between the planks, with yellow pine wedges, 3 inches wide, instead of being caulked with oakum, which gets wet and rots. The limber boards continued loose.

In *Prussia* a fass of Charcoal is 59 gallons ; in *Austria* and *Hungary* a sahm = 6·768 bushels ; at *Vienna* a stubich = 3·384 bushels ; an *Austrain* stere of wood charcoal 141 kilos. = 310 lbs. ; peat ditto 300 kilos. = 666 lbs.

113. CHARTER-PARTY. There are no fixed forms for charter-parties: those recommended by the Report of the Council on Freights (grain, &c.) will be found in full at the close of the article grain. Under guano, oranges, pilchards, &c., the forms used for those articles are attached; for broken stowage, see timber. Generally the instrument shows the register tonnage, and sets forth the terms upon which the owner or master engages the ship, and the freighter or charterer takes her. When at home, it is usually signed by the owner and the charterer; abroad by the master and the charterer's agent. The master's signature at home is equally binding, if acting under his owner's instructions. If a master signs contrary to the instructions of his owner he is bound by the charter, but the master is liable for any loss accruing. It may be on plain paper, stamped afterwards. The owner pays the cost of stamping, which the broker is bound to have done within fourteen days, unless directed by both principals not to do so. The certified copies or duplicates of charter-parties given to merchants and masters must be all stamped.—13 and 14 Vic., cap 97. On the margin of unstamped copies it is usual to write "certified true copy of the original stamped charter-party in our possession." If a copy is signed it must be stamped; if copied in full it need not be stamped. The original charter-party, whether single, in duplicate, triplicate, &c., must be stamped; the duty is 1s.; within 7 days, 4s. 6d.; 28 days, £10. When signing masters should recollect that the terms "port" and "harbour" are not synonymous. Should the ship not be ready by the appointed time, or should the charterer not be ready with the freight, an action for damages may be brought by the injured party; see demurrage.

114. When chartered for a **lump sum**, the draft of water should be limited; sometimes brokers insert a clause that coal is not to be considered as dead-weight, in order to fill up in case of other goods falling short, to make up the chartered freight. The master will only take as much as his ship can conveniently carry, although the charter-party may say a full and complete cargo. Full and complete cargo has been held to consist of as much as the vessel can stow and carry, in addition to her stores and provisions, in the holds under the hatches. Some merchants, to protect themselves when chartering a "full cargo," insert the words "warranted.....registered tons or thereabouts," thereabouts meaning fractional parts only. Otherwise a ship may be described as 250 tons register or thereabouts, and prove of 300 tons, and thus carry 150 or 200 tons more than the merchant has cargo to ship, and yet he is bound to provide the extra quantity or suffer the loss. The custom of the port will often regulate the

reception and discharge. The East Coast of England extends geographically from Dungeness to Newcastle, but for chartering, the river Thames is by usage the boundary; Sandwich and Dover are thus considered in the English Channel. Copenhagen is sometimes named as a Baltic port; strictly speaking it is not so, but a "port in the Sound."

115. When a charter is broken by **bankruptcy** or other causes, it is the duty of the master to give the charterer written notice, that unless he completes the contract within say 10 days, that he, the master, will re-charter the vessel, holding the original charterer liable for all damages that may arise.

116. It is recommended that in drawing up charter-parties for **Italian ports**, it should be stipulated that the freight is to be paid in "gold or silver." "In cash" is of no use, as the paper currency is considered as cash, and is a legal tender. The forced circulation of paper currency has caused a great depreciation in its value.

117. Mr. E. GILES, R.N., says: "ships going out with iron rails to **Kurrachee**, are promptly despatched; those with government stores, such as beer, &c., have often to wait a considerable time before they can discharge cargo; captains should therefore be on their guard in signing charter-parties. Captains discharging a cargo of **beer** should see that the Customs' officer puts a seal on every hole pierced in the casks; this is often neglected to be done. The mate of the ship should note down the numbers of the casks from which samples of beer have been drawn, and the Customs' officer has to give a certificate, in which these numbers are put down. On receiving the cargo on board, the mate should be careful that no holes have been bored in the casks; if so they should be returned as not being in good condition, certified by the captain. All casks, empty or half-empty, are examined on landing, and if there be holes in them *not sealed*, the ship has to pay for them. In the charter-party, no matter what the cargo may be, the **lay-days** should be exactly specified and also marked in the bills of lading so as to acquire validity, as the facilities for discharging at this port are very deficient. In the "bunder" there is only one pier with two cranes. All vessels have to discharge here, and there is only space for two lighters at a time. It often happens also that the pier is taken possession of by the government in order to land or embark troops or horses; in that case no vessel can be discharged, even if she have lighters, which are at these times difficult to be obtained." Vessels can load to 22 feet at this port.

118. When giving judgment early in December, 1869, in the Hartlepool County Court, Mr. HENRY STAPYLTON (the judge) stated that "it had been held in the Superior Courts of late that writing over-ruled sentences in print, it being assumed that the latter were often left in accidentally or carelessly." The action was one for **demurrage** by the owners of the ship *Enterprise*, who obtained £4 for one day. At the foot of the charter-party there were *in writing*, the words "the ship to be laden on or before the 11th instant," yet in the body of the document there remained, unobliterated, the *printed* words "the freighters not to be liable for any delay in loading."

119. **Dead Freight.** Common Pleas, 2nd July, 1851. *NICHOL v. ELLIS*; the *Balgownie* was chartered to load a cargo of soda, nitrate of soda, guano, or copper ore, &c., "not exceeding one-third more than her register tonnage, *o.m.*;" this is intended to protect ships from being overloaded, and does not oblige the charterer to ship the full amount. It is enough if he put on board so much cargo as the ship can conveniently carry, but if more might have been properly shipped than was put on board, the shipowner is entitled to a verdict for dead-freight. The measurement of the ship being 379 tons, *o.m.*, and 325 *n.m.*, one-third more added to her old measurement would equal 505 tons 6 cwt., and there were shipped of copper ore only 453 tons 4 cwt., leaving a difference of 52 tons 2 cwt., which it was contended could have been shipped; freight and primage thereon would have amounted to £246 3s. 6d. Jury gave £150 damages; see *Brevet*, in the article guano.

120. **Sydney General Cargo.** In the case of *PUST v. DOURE*, tried at Liverpool, in August, 1863, there was a claim of £216 12s. balance of freight alleged to be due on a charter-party. Plaintiff stated that he contracted to carry 1,000 tons general cargo "weight and measurement," for a lump sum of £1,550, less three months' interest on £1,330 8s. paid to the master in Liverpool. The charterer stowed 524 tons 19 cwt. weight goods, and 330 tons measurement, making in all 855 tons, but there was space left capable of holding 160 tons measurement. There should have been one-third weight goods and two-thirds measurement. At Antwerp she had taken 1,022 tons, and Liverpool surveyors would state that she could take 1,000 tons, she registered 544 tons. Defendant stated that a Sydney cargo was invariably two-thirds measurement, and one-third weight. The jury decided that the ship was capable of carrying 1,000 tons of ordinary cargo or 850 tons of Sydney cargo; but defendant was entitled to a deduction of 31s. 7d. ton on the difference between 850 tons and 1,000 tons, amounting to £224 15s., which being more than the amount claimed, leave was given to move in the Court of Error. [This decision was received with some surprise by the mercantile community.]

121. **Ooke.** A vessel was chartered to load in the Tyne (September, 1863), for a Mediterranean port, a general cargo to consist of, say 100 tons of iron goods and the remainder other merchandize, at a lump sum of £638 and £10 gratuity. Ship guaranteed to carry equal to 23 keel, dead weight. The vessel was laden, per bills of lading, as follows :—

	ton	c.	qr.
Anchors and chains	33	13	2
Iron rails	54	19	3
Fire clay, in bulk	84	0	0
Casks, (38) magnesia, soda, alkali, and other } light goods	3	10	3
Fire bricks.....	72	10	0
Coke, 15 keel (11 tons $\frac{1}{2}$ keel)	165	0	0
TOTAL	413	14	0

Thus showing an apparent deficiency of 73 tons 18 cwt., as 487 tons 12 cwt. (23 keel) was the weight the ship was guaranteed to carry. The merchant claimed to make a deduction from the freight for 73 tons 18 cwt., but his claim was not considered equitable, because the coke alone (15 keels or 165 tons) occupied a space equal to 12 keels of coal or 254 tons 8 cwt., showing a difference in favour of the vessel of 89 tons 8 cwt. By the latter calculation the vessel took $15\frac{1}{2}$ tons more than the quantity guaranteed.

122. French Charter-party. Entre les sous-signés Capitaine du navire jaugeant en douane tonneaux actuellement Fréteur d'une part ; et affréteurs, d'autre part.

Art. 1. Le Fréteur s'oblige à se mettre à la disposition des affréteurs le susdit navire, bien étanché, grée, équipé, et avitaillé, en un mot, en parfait état de navigabilité et à le rendre à pour recevoir dans le temps ci-après stipulé, un plein et entier chargement de sans égard à la jauge pour la destination de

Art. 2. Le navire recevra son chargement des affréteurs, ou de leur agent.

Art. 3. Le capitaine prendra compte du nombre et du poids des marchandises embarquées, afin de signer ses connaissements conformément.

Art. 4. Le navire charge, le capitaine s'engage, après avoir signé ses connaissements et reçu toutes ses expéditions, à partir au premier temps favorable, pour le lieu de sa destination, où, après arrivé et parfaite livraison de son chargement au porteur des connaissements, il lui sera payé pour fret, comptant et en espèces, la somme de.

Art. 5. En cas de remorquage les affréteurs n'y contribueront.

Art. 6. Il est accordé jours ouvrables et reversibles pour charger et décharger.

Art. 7. Les jours de planche ci-dessus fixés, étant expirés, il sera payé au capitaine pour chaque jour de retard, soit pour charger ou décharger, la somme de CINQUANTE CENTIMES, par tonneau de jauge.

Art. 8. Les marchandises seront amenées sous palan, ou jetées sous le pont de navire, et livrées de même, par le capitaine, aux frais et risques des affréteurs ou des consignataires.

Art. 9. Tous les frais et droits relatifs à la cargaison seront supportés par les affréteurs ou les consignataires, et ceux concernant le navire, par le capitaine.

Art 10. En cas d'avaries grosses, elles seront réglées suivant les usages.

Pour l'exécution des susdites clauses et conditions d'affrètement, les parties contractantes engagent mutuellement le montant du fret.

Cinq pour cent. de commission sera payé par le capitaine aux affréteurs sur le montant de son fret.

Fait et signé après lecture, par les parties ou par le courtier susdit, vers qui la présente charte-partie demeure déposé à titre de minute, pour en délivrer expédition à qui de droit.

*Signé par le dit
Temoin*

*Signé par le dit
Temoin*

123. CHASSUM. Bombay ton 10 cwt.

124. CHEESE. Dutch is frequently injured through insufficient flooring; it should not be stowed more than two deep, on suitable platforms; ships not fitted for its stowage in bulk should be provided with a platform for the ground tier. Dutch cheese is usually freighted by the lump, with other goods; freighting by the lump secures to the charterer the opportunity of having the cheese well ventilated. A ship will not stow her register tonnage of Dutch cheese. One thousand (1,000) weigh about 38 cwt. For a long voyage they should be packed in cases with partitions between, and the cheese stowed in the separate cells surrounded by juniper berries. These berries to a great extent absorb the moisture that comes from the cheese. Edam cheese, which is small (about $3\frac{1}{2}$ lbs. each), is shipped all the year round, and is usually exported from Amsterdam to the Mediterranean; larger cheese are sent to Håvre, the Bay of Biscay, and other near ports. Small Cheddar, from 9 to 12 lbs., are carefully packed in cases, say in sixes; if possible each should be also covered with some substance to protect it from rats. When packed in tin or zinc and the ship is some time in the tropics, fermentation will burst the solder, and the contents will become oily and liquid. Cheese stowed in oats will be similarly affected. It is sometimes enclosed in skins or in limed canvas. All kinds should be kept off from damp goods or vapour goods. American cheese is very liable to become heated through improper stowage. Cheese, especially if new, requires frequent turning.

Tonnage, &c. 20 cwt. go to a ton. A clove or half-stone of cheese or butter 8 lbs., a stone 16 lbs., Suffolk wey 32 cloves or 256 lbs., Sussex 42 cloves or 336 lbs.

125. CHERANG, a lack varnish; Bombay ton 20 cwt.

126. CHICORY, the *Chichorrium Jutybus*, of Linnæus, an endive that grows wild on the calcareous soils of the north and the south of England, and in most parts of Europe; quantities are produced in Holland and Belgium and are shipped at Bruges and Harlingen; the **harvest** there is in October, but shipments take place all the year round. Before chartering, ascertain the kind offered. Chicory may be divided into four kinds, *crude*, *kiln-dried*, *roasted*, and *ground*.

CRUDE chicory, viz., the green roots which are about the size of parsnips, is seldom put on board ship; the roots are cut up for the

kiln, after passing through which they are called raw or *kiln-dried*. They are then *roasted* in the same manner as the berries of coffee, and afterwards broken into nibs or pieces about the size of coffee berries, so as to be ground in the mill with coffee, or *ground* to powder for mixture with and as a substitute for coffee.

KILN-DRIED chicory is mostly stowed in the hold in bulk; when packed it is in bags. A Goole vessel of 63 tons register stowed 65 tons of kiln-dried roots at Bruges. A sack containing four bushels will weigh 1 cwt., which gives 28 lbs. to the bushel. During the passage at sea it usually gains in weight. Kiln-dried chicory soon becomes mouldy by dampness: it is not considered liable to damage other goods.

ROASTED and GROUND chicory for exportation is packed in tins from 28 to 56 lbs. each, soldered to prevent the contents from becoming hard; these are enclosed in cases of from 1 to 2 cwt. each, and in casks of 4 to 7 cwt. Chicory nibs weigh lighter than coffee berries, but ground chicory or "powder" as it is called, weighs heavier than ground coffee, viz., 38 lbs. to the bushel, coffee being 36 lbs. A flour barrel is estimated to hold 168 lbs. of chicory powder and 196 lbs. of American flour. When roasted, chicory is less liable to injury, but it has a tendency to toughness. The Germans, after grinding their roasted chicory, damp it and mould it into blocks; the English pack it dry, but it often becomes hard by exposure.

WEIGHT OF A BUSHEL.

CHICORY.		lbs.	COFFEE.		lbs.
Raw or green roots.....	say	50	Raw or green berries		51½
Kiln-dried		28	Roasted		32½
Powdered		38	Ground	say	20

By roasting, coffee loses in weight 20 lbs. in every 112 lbs.

127. CHINA ROOT, a species of *Smilax*, which grows in the West Indies and China. Bengal and Madras ton 11 cwt. in bags, or 50 cubic feet in boxes: Bombay 50 cubic feet in boxes. China 12 peculs in bags.

128. CHINSE. To chinse or chinch, is to caulk slightly, with a knife or chisel, those seams or openings which will not bear the force required for caulking more securely; see hatches in the article mate.

129. CHIRETTA, a bitter plant. Bengal and Madras ton 50 cubic feet.

130. CHLORIDE OF LIME, or bleaching powder, is soluble in water, and liable to decomposition through heat and moisture. As the gas evolved from it corrodes metals rapidly, and has an energetic

action on all vegetable substances, the greatest care is necessary when stowing with a miscellaneous cargo for a long voyage, that it be properly packed, *i.e.*, preferably in stone jars, but at least not in dry but in close tight casks, well hooped with wooden hoops; it is however stated that the vapour of chloride is nearly as destructive as actual contact with the article itself, so that the most careful stowage cannot be relied on as a preventative; see bleaching powder and dangerous goods. The schooner *Lovina*, Capt. JONES, of Aberystwith, which was in the Liffey, laden with sulphate of soda and chloride of lime, waiting for a fair wind for Antwerp, had one of her crew suffocated, 18th January, 1870, and two more had to be taken to hospital in a dangerous state. THOMAS WILLIAMS, the mate stated that he went to call the men at 10 o'clock a.m.; and, getting no answer, went into the forecabin, where he found one dead and the other two insensible. He immediately carried them on deck. In a short time he saw smoke issuing out of the fore and after hatches, and found that the casks containing the chloride of lime had in some unaccountable manner ignited, which would have been the cause, but for his timely aid, of the three men losing their lives. The vessel did not sustain any damage from the fire.

131. CHOCOLATE, a kind of cake or hard paste made of the pulp of the cocoa or chocolate seed, gently washed and mixed with sugar, cloves, cinnamon, and other spices. Chocolate is exported from France, Sonsonate, and Peru. The Admiralty rate is 16 half-hogsheads or 26 small casks to a ton. Admiralty half-hogshead is 108 lbs. net, and small cask 55 lbs.

132. CIDER for warm latitudes is best in small packages; see ale, casks, liquids, &c. For exportation it is said that cider should be at least twelve months old or it will be very liable to burst; specific gravity 1.018. A pipe contains 100 to 118 gallons.

133. CINDERS. 16 chaldrons weigh 10 tons, and occupy a space of 850 cubic feet or 1 keel.

134. CINNABAR, a red ore or mineral substance, from which mercury is chiefly obtained; specific gravity 5.419 to 10.1285. E.I. Co.'s ton 16 cwt.

135. CINNAMON, the dried under bark of the branches of a species of laurel tree. The bark is stripped from the beginning of May to the end of October. It is shipped chiefly at Ceylon, and most frequently during the south-west monsoons, but especially in September and October. A small quantity only is exported from Java, whence it is shipped all the year round. Those who taste and

chew it, to examine the quality, can seldom perform the disagreeable duty for more than two days at a time, as it deprives the tongue and lips of all moisture. When cut into small pieces they curl up, and the smaller are slipped inside the larger. The bundles are very light and are usually placed on the top of the cargo, and sometimes the interstices are filled with black pepper, to prevent the flavour from evaporating. At Ceylon and Singapore it is packed in bales or bags of 60 to 100 lbs. each, of which eight are said to go to a ton for freight. 6 cwt. in bales, and 50 cubic feet in chests, go to a ton at Bombay. A bale is 80 lbs., 92½ lbs., &c.

136. CIVET ; much of the civet citronella oil is produced by distilling the leaves of the *Andropogon Schœnanthus*, which grows wild in Ceylon. In the neighbourhoods of Galle and of Colombo, large tracts are under cultivation. The average export from Colombo is about 4,000 lbs. annually ; and the price is 4s. 1d. ½ lb. The civet now brought to European markets is from Calicut, capital of the province of Malabar, from Bassora on the Euphrates, and from Abyssinia.

137. CLAY, like other heavy materials, should lie on the floor, fore and aft, and be raised to a point at the main hatchway, decreasing towards the bow and stern. 20 cwt. go to a ton ; formerly at Teignmouth 22½ cwt., on account of its wetness ; specific gravity 1·92.

138. CLOTH ; in the Admiralty tables of tonnage, at the commencement, will be found the allowance for freighting cloth coats, jackets, trousers, great coats, flannel, serge, stockings, blankets, shirts, palliasses, bolsters, sheets, towels, &c.

139. CLOVES are the flower buds of an East India tree growing in the Molucca Islands ; 5,000 weigh 1 lb. ; they readily imbibe moisture if stowed near any liquid. In the Dutch settlements they are made up, the best in chests, inferior in bags. In Colombo they are packed in small bags of 50 lbs. each, and are exported thence all the year round, but more in the south-west than in the north-east monsoons. In Amboyna the **harvest** takes place in November and December. In Zanzibar they are packed and shipped direct for England in irregularly-shaped mat bags, weighing about 120 lbs. ; they should be stowed in the 'tween decks, or high up in small vessels. Bengal and Madras ton, 8 cwt. in bags, 50 cubic feet in chests ; Bombay 50 cubic feet in chests, and 10 cwt. in bags ; sometimes at Bombay 7 cwt. only go to a ton, because the packages are what are termed " mats " and occupy much space. A mat weighs 80 lbs. ; a chest 200 lbs.

140. **COAL.** Ships sail best when coal is heaped up towards the hatchways. Small vessels cannot, however, afford to lose any space. **Coasting colliers** are always fully laden. With 'tween-deck ships the lower main hatches are left open to replenish the hold, as the cargo settles; the loss of several large ships has been attributed to neglect in not removing a sufficient number of planks from the 'tween decks to permit the cargo to be fairly distributed in the main hold. When loading, the large coal naturally falls away to the wings, and a quantity of small coal is thus produced, and is often found immediately under the hatchways; this obstructs the approach to the large, however much there may be, and the consignee declines possibly to receive the cargo until the dust is thrown on deck; the consequent delay might be avoided by trimming off the small at the loading port. Merchants who ship large cargoes at Newport frequently dig out a few tons of dead small in the wake of the hatchway, and replace it with large. At Newcastle eight men as trimmers are usually employed in the hold, and they take care to remove the small from the hatchways. Gas coals are most friable, steam coals the least. At Liverpool two-thirds of the coal shipped is brought down by canal boats and is then carted to the docks, which involves considerable waste, and thereby diminishes the freight; when transhipped direct from the canal boats there is very little loss. At Calcutta consignees sometimes offer to accept cargoes by the quantity in the bill of lading, less 4 per cent., but masters will exercise their own judgment herein. The *Ravenscraig* (see linseed) shipped 770 tons at Liverpool in March, 1862, and discharged 830 tons at Calcutta in July, 1862—every tenth basket was weighed. In bills of lading there is an important case relative to the discharge of coal at Singapore. Coal is said to encourage dry rot in the woodwork of the holds of ships and is liable to spontaneous combustion. Coal that has been under water is considered damaged. A master loading a cargo of coal is not obliged to sign for weight unless he can satisfactorily check the weighing and establish the fact.

141. **Ignition of Gas.** There are in loading coal two sources of danger; one, from gas or fire damp given out by newly-wrought coals rapidly transferred from the mine to the ship; the other from spontaneous combustion in the cargo. The gas emitted by the coal is exceedingly light, and very similar to the ordinary coal gas used in our houses. It rises to the deck, unless kept down by accumulations of coal, &c., and would, if not prevented, escape to the air, and pass away without danger. It is highly explosive when one volume is mixed with from nine to twelve volumes of atmospheric air, and

hence the necessity for great precautions being taken that it shall not accumulate, but that it may be allowed a free exit. For this reason all hatchways should be kept open for many days after the cargo has been received on board; indeed, the gas may be "bottled up" for any length of time if the means of escape be withheld, and be dangerous for weeks after shipment. It must be borne in mind, however, that no explosion can occur unless a light be applied. The striking of a match against a bulkhead, or the taking of a candle below has often been the cause of serious damage and occasional loss of life. No person should be allowed to go below the deck with a light, if there has been no free current of air admitted, without being provided with a safety lamp. It is very desirable that in every vessel two pipes about eight or ten inches in diameter, just passing through the deck, about five feet high, with moveable cowl heads, should be placed—one forward, the other aft; then if a free space fore and aft be left in the coal, sufficient ventilation would be given to obviate all danger from the gas.

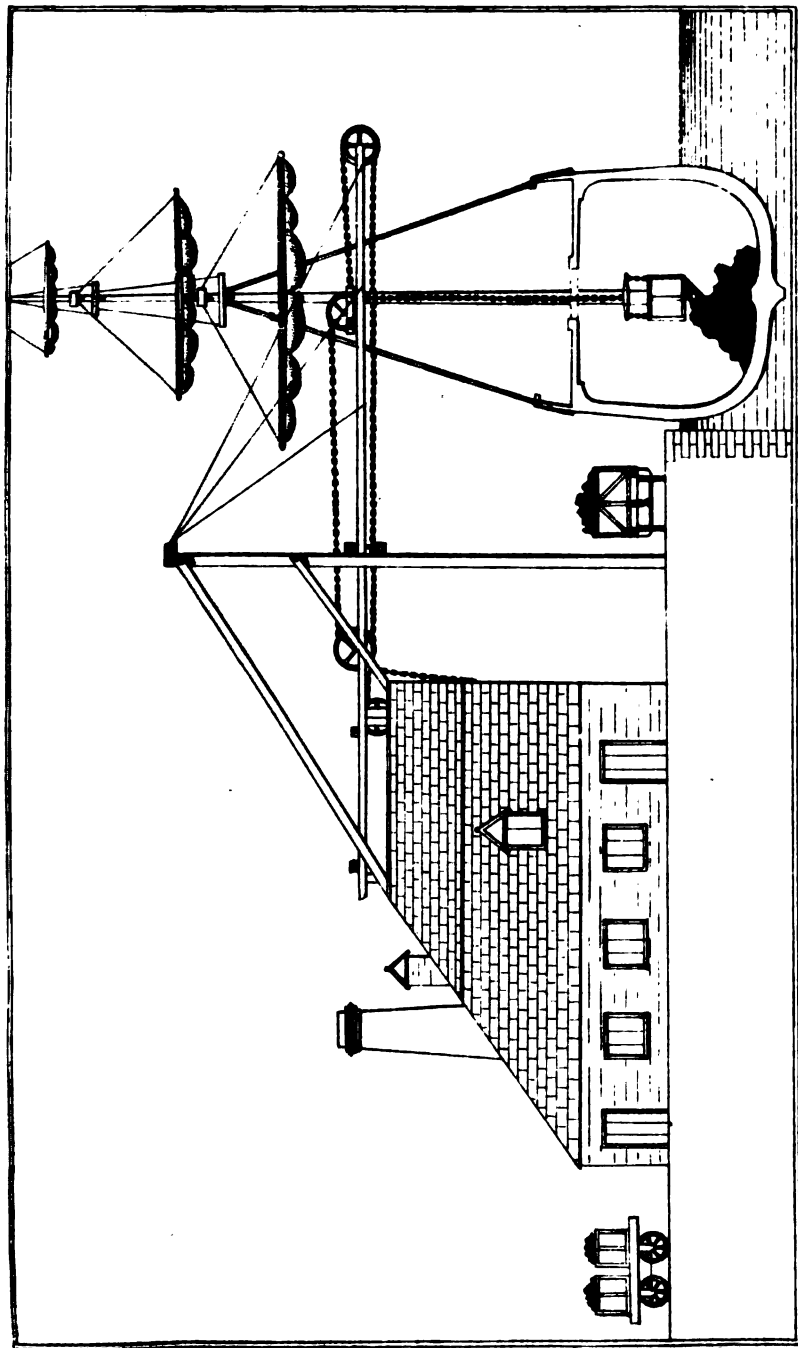
142. Spontaneous Combustion. Most descriptions of coal have iron and sulphur in their composition. When deposited in large quantities for a considerable time, and not kept perfectly dry a chemical action sets up between the iron and sulphur, which at last ignites the coal. Many vessels are yearly lost by this circumstance. In loading coal liable to spontaneous ignition, great care should be taken to ship the cargo dry, and keep it so on the voyage. There is much more risk with small coal than with large. It will be found that fires originate generally in the middle of the cargo under the main hatchway, where the greatest portion of coal dust lies. *The use of wooden pipes in the cargo is most dangerous.* Most of the recent fires in coal cargoes may be attributed to this absurd practice. The soft wood generally used will take fire at a much lower temperature than coal, and being placed in the main hatchway, where the small coal is deposited, the pipes first get very dry, then the point of ignition is reached. They convey air to fan the smouldering wood into a flame, and afford means for the fire to spread. Had there been no wooden pipe the coal would have heated, but a much longer time would have been necessary to have attained the higher temperature at which coal ignites as compared with wood. If pipes be placed in the coals, they should be metal or earthenware.

143. Weight. There is no great difference in the weights of different kinds of ordinary coal, the lightest being about 74 lbs., and the heaviest 79 lbs. the cubic foot; but the most usual weight is 75 lbs. which is 18 cwt. 9 lbs. the cubic yard. Unscreened Newcastle coal

for gas and other purposes is heavier than screened, and consequently when ships are laden with that coal, they draw more water. Steam coals being harder do not become so much broken as house coal, and thus relatively occupy less space; this is the main cause why ships fully laden with steam coals are more deeply immersed than when fully laden with house coals. This refers to coals from which the dust and small have been removed by passing over screens, as coals which are not so treated, and are shipped in the state in which they came from the mine (large and small mixed), weigh heavier than screened coals, to the extent of 10 ϕ cent. or thereabouts. It arises from the fact that the dust and the small are mingled with the larger pieces and leave fewer interstices. Coal for gas purposes is of this description. There is scarcely any appreciable difference in the specific gravity of steam or house coal, or of any of the coal in the Durham and Northumberland fields. A cubic foot of solid coal weighs about 80 lbs.; if broken, the same weight occupies nearly $1\frac{1}{4}$ cubic feet of space. As a general rule Cardiff coal is of greater specific gravity than Newcastle coal. In hot parching weather Newcastle coal frequently weighs out short. This is sometimes occasioned by the heat which makes the waggons "pine" between the pit's mouth and the place of shipment. An experienced shipper says that Hartlepool coal may, as regards weight, be assimilated with HASWELL'S Wallsend, the specific gravity of which 1.28. Taken as a dead-weight cargo, the quantities of coal which can be carried by various ships of certain dimensions, are recorded incidentally in this work under the head of several different articles, for which see the index; see also ballast, general cargo, and glass. At the close of this article there are tables of specific gravity of coal.

144. An experienced merchant residing in a Channel port, when treating on the weights of coal, says: "that masters of vessels term cannel coal heavy, Cardiff heavy, chalks light, Hartlepool West heavy, Old light, Liverpool light, Middleborough medium, Neath light, Newcastle light and medium, Newport heavy, Porthcawle medium, Sunderland light and medium, and Swansea heavy. One ϕ cent. and two ϕ cent. additional may be promised at the loading ports, but the weights discharged depends often on the state of the weather; if raining when loading the weight will be there; if dry the cargo often makes out less than the intake invoice. He has received 4 to 6 tons less than the invoice; his cargoes ranged from 150 to 300 tons. He has received a surplus on cannel coal, but sometimes 2 to 4 cwt. short of the shipment, which is attributed to the fact of its being liable to chipping when loading and discharging."

STEVENS ON STOWAGE.



LOADING COAL AT CARDIFF.

145. **Weight and Measurement.** Mr. R. C. TAYLOR says :—
 “we will now advert to two or three facts which have come to our knowledge respecting the uncertainty of any standard of measurement after a long experience, that can be adopted as a substitute for weight in selling coal. For instance, one bushel, *measured when dry*, weighs from 84 to 85 lbs. The American bituminous coals are commonly averaged at 80 lbs. Φ bushel. The same coals, *if measured when wetted*, paradoxical as it may appear, the weight will be found not so great. The fact is proved conclusively, that in the dry coal the small particles run to fill up the cavities, making the whole almost solid, whereas wet coal only closed up the hollow cavities in the bushel; the fragments clog together, and the whole did not weigh so much as the dry coal of the like admeasurement.”

146. Formerly it was calculated that if a block measuring exactly a cubic yard, nearly equal to five bolls, be broken into pieces of a moderate size, it may measure seven bolls and a half; if broken very small, it will, it is said, measure nine bolls. A boll is 36 Winchester bushels = 9,675 cubic inches; $7\frac{1}{4}$ bolls = 1 cubic yard of coal; 6 bolls = 1 chaldron. In Scotland 36 cubic yards of coal are equivalent to 32 tons weight.

147. At Charleroi in **Belgium**, the different classes are distinguished by the following divisions :—

1. Fat coal, *gros*. 2. Medium coal, *demi-gros*. 3. Lean coal, *meagre*.

Each of these qualities is sub-divided into minor classes : *Gros*, pieces selected at the mine; picked large coal. *Toute-venant*, the remainder after selection of the *gros*. *Gaillette*, a sizes maller than the *gros*, but which must not be less than six inches square. *Gailletterie*, the coal which remains after deducting the *gaillette* and the *menu*, passing through a sifter of $1\frac{1}{4}$ inch openings. *Menu*, that which has passed through a *cribble* or sieve whose meshes are $1\frac{1}{4}$ inch wide.

148. At **Newport**, coal remains some time in the trucks, and if the weather is wet the cargo on delivery turns out short. Merchants in English Channel ports complained, in 1865, there where shipments from Welsh ports formerly left on discharge a fair per centage in favour of the consignee, the discharge latterly has been short of the quantity invoiced. Masters have had to pay out of their freight for the quantity deficient by bill of lading. At **Cardiff**, mates should keep an exact account of the number of the wagons and barges, so that they may be satisfied as to the weight and quality shipped, by referring to the documents which accompany the trains and canal boats. At the terminus yard, **Glasgow**, it is the usual practice to supply coal only in trucks of 10 tons each, so that masters have to load more or less.

149. At **Birkenhead**, in 1864, the stevedores paid the coal-heavers per ton ; 9*d.* for discharging ballast, 8*d.* for loading coal, and 3*d.* for trimming ships up to 400 tons, and 6*d.* above. A vessel there received from the tip 270 tons between four o'clock in the afternoon and eight the next morning.

150. In the **Tyne**, where the wagons are let down by a drop, and are computed to hold 53 cwt. each, it has been recommended to have the contents of one full wagon weighed, and to see that the others are full, in order to fortify the master who has to sign bills of lading for weight, although, generally speaking, he never sees the cargo weighed. On the Tyne and Wear, the original wagon of 53 cwt. is being largely superseded. Coals are brought for shipment in trucks containing from 4 to 8½ tons. Cargoes shipped at Hull and discharged in a port in the English Channel usually make out short of the quantity invoiced.

151. **Loading in the Tyne.** Shippers are compelled by law to load vessels in due turn as they are ready. The Act of Parliament applies only to vessels of more than 6 keels (127 tons 4 cwt.), but through custom it is adopted almost universally. The detention in the Tyne depends therefore mostly on the length of turn. Steamers do not take turn with sailing ships. The greater certainty and regularity of steamers in performing their voyages made it necessary to arrange for their loadings some time beforehand. Steamers are usually on time charter, and run regularly to London or elsewhere, where there position a week or a fortnight in advance is always known (accidents of course excepted), and arrangements are made by the colliery accordingly. Sailing ships are uncertain even after arrival in the port, having ballast to discharge, to do which they have a longer or shorter time to wait. Hence the loading of the two classes of vessels are practically kept separate. Steamers load at the time pre-arranged for, and sailing ships take turn among themselves. This plan, which is the only one that will suit the requirements of the Tyne coal trade, is found to work very well and satisfactorily. The time occupied in loading ships, when actually commenced, depends on the produce of the colliery ; smaller collieries will load 12 to 15 keel per day, the larger ones 30 to 40 keel, and upwards ; some of the gas collieries ship 1,200 and 1,500 tons per day. Coal shipments in the River Weir are much the same as those on the Tyne. In the article demurrage reference is made to the time occupied in loading and unloading coal.

152. The usual rate of discharge in the pool in the **Thames**, is 49 tons per day ; Queen's Bench, 25th June, 1853, and 12th August, 1855.

153. **Gas Coal.** Newcastle gas coal is heavier than HARTLEY'S. Peareth main and Pelay main gas coal will stow 3 or 4 $\frac{1}{2}$ cent. more than ordinary house coal, from the same pit. In the delivery of a large quantity of Newcastle gas coal at a Channel port, the discharge has been 3 $\frac{1}{2}$ cent. more than the quantity invoiced.

154. **Cannel.** Glasgow cannel stows at least 10 $\frac{1}{2}$ cent. less than Newcastle house coal. One authority says that Newcastle cannel stows and turns out the same as house coal; others say that it is so much heavier than ordinary gas coal that a ship cannot fill herself with it; RAMSAY'S cannel is much heavier than ordinary gas coal, a ship cannot fill herself with it. Specific gravity of cannel say 1'270. Dr. URE says 1'238.

155. **Culm** (Welsh) is shipped chiefly at what are termed the lower ports in the Bristol Channel, Neath, Llanelly, Swansea, and Burry Port. Culm is anthracite or smokeless, and is heavier than Welsh coal; it is generally shipped "unscreened," or what is termed "through and through," as it is raised from the colliery. The large is used in malt-houses, the small in lime-kilns. The brigantine *Souvenir*, of Jersey, which registers 157 tons, and is 97 feet long, rolls very much with 297 tons of Llanelly culm, when she draws aft 13 feet 4 inches, forward 11 feet 10 inches, and her hold is say seven-eighths full. When filled with 300 tons Llanelly coal she draws 13 feet aft and 11 feet 6 inches forward and is comparatively easy at sea. With 285 tons Newcastle coal (High Jarrow), which fills her chock-a-block, she draws less than with the Welsh coal. Specific gravity culm 1'300 to 1'370. An Irish barrel of culm is 24 cwt. The master or owner of every steamer trading to a foreign port must, within six days of final clearance, deliver to the custom-house a certificate of quantity of coal or fuel shipped for ship's use, under a penalty of £5; see Customs' Laws Consolidated Act, 1876.

156. **Coke.** The specific gravity averages 0'744; this may be correct in regard to coke produced in gas works, which is much lighter than that made for locomotive and furnace or foundry use. Even among the latter cokes, shipped in the Tyne, there is considerable difference in the weight. The best foundry Tyne coke is very heavy, and the condensed is nearly the weight of coal. In the standard table of goods proportioned in stowage, at the beginning of this work, 11 tons are taken to occupy the same space as 21 tons 4 cwt. or 1 keel of Newcastle coal. In practice, ships stow 12 tons of coke per keel; large vessels more. A vessel was chartered at £23 $\frac{1}{2}$ keel of 21 $\frac{1}{2}$ tons upon the quantity of coal which the master guaranteed to load, *i.e.* 9 keel. She loaded 6 keel of coal and 3 $\frac{1}{2}$ keel of coke. The merchant con-

tended she was not of 9 keel capacity. The master, however, proved that he had discharged 885 quarters of wheat, which is over 9 keel bulk ; and that he had had 200 tons of iron ore, and at another time 194 tons of iron, on board. This was considered sufficient evidence of the ship's capacity for 9 keels of coal. An experienced coal owner considers that the coke loaded in this case must have been of a very light description ; with heavy Tyne coke she would have taken 6 keels of coal and nearly 4 keels of coke. A good stowing ship of 9-keels capacity should take 6 keels of coal and 4 of heavy coke ; or 40 tons of coal and 8½ or 9 keels of coke. RAMSAY'S patent condensed coke (Newcastle) is of the specific gravity of steam coal, or nearly so. Peat coke is estimated to occupy the same space as common coke. The details of a partial cargo of coke occur in the article charter-party.

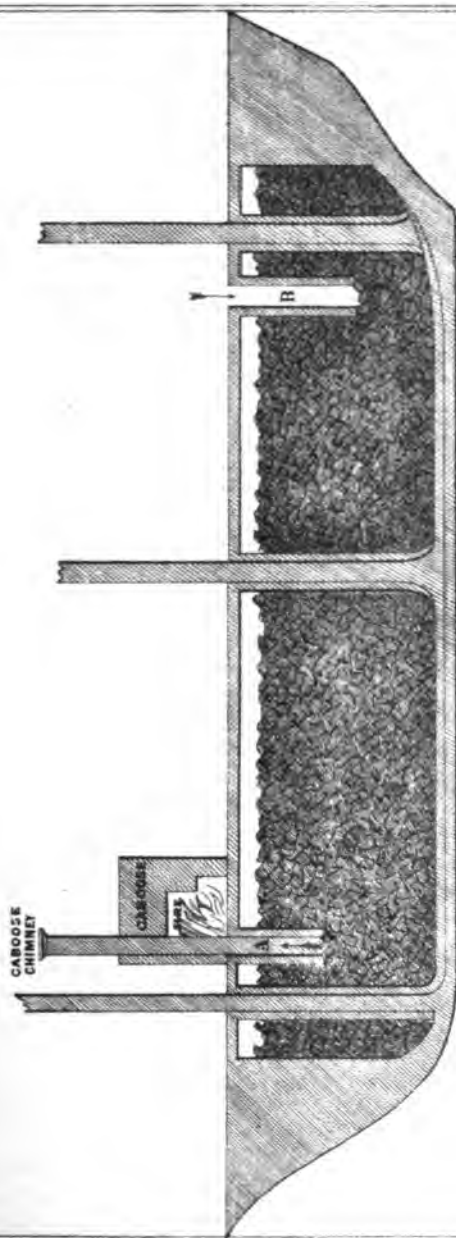
157. **Charcoal.** It is the common practice to estimate 100 tons of charcoal to occupy the same space as 200 tons of coke ; see charcoal.

TWELVE CARGOES INVOICED AT NEWCASTLE AND DISCHARGED AT PLYMOUTH.

NEW PELTON.			Quantity.		Made out.	
			tons.	cwt.	tons.	cwt.
Dec. 12, 1862	STAR OF THE WEST		265	0	283	13
July 9, 1863	Ditto		275	12	278	9
July 2, 1863	TAMAR		190	16	197	15
Oct. 9, 1862	CONQUEST		318	0	331	19
Mch. 9, 1863	Ditto		318	0	332	16
PEARETH COAL.						
Sep. 10, 1863	STAR OF THE WEST		269	10	284	15
Feb. 25, 1864	Ditto		273	0	285	9
May 29, 1862	TAMAR		196	0	207	8
July 1, 1862	Ditto		192	10	198	15
Aug. 9, 1862	Ditto		189	0	193	17
Aug. 10, 1863	Ditto		199	10	210	10
WASHINGTON COAL.						
Oct. 16, 1863	STAR OF THE WEST		280	18	271	9

Dimensions *Star of the West*: register tonnage 176, length 89 feet, breadth 19 feet 7 inches, depth of hold 12 feet 8 inches. *Tamar*: register tonnage 133½, length 76½ feet, breadth 17½ feet, depth of hold 11½ feet.

158. For conveyance abroad the harder descriptions of coal are considered best, not being so liable to break during the transit from the pit to a distant place of discharge. Mr. MORGAN, British Consul at **Bahia**, complained in 1856, of the preference given to foreign vessels by the merchants there. In alluding to one of the causes,



A UPCAST. B DOWNCAST.

HUNT'S METHOD OF VENTILATING COAL-LADEN SHIPS.

he says: "some agents charter on their own account vessels which, having only a limited time to load, are filled up to the main hold to make it appear that they are nearly loaded and ready for sea. When the lay-days expire, those brokers, in order not to pay demurrage, fill up the sides and cover valuable property with coal. Cambrics, muslins, and other fine articles are thus spoiled, and consignees naturally object to being subjected to such carelessness." Coal from **Sydney** is frequently short of weight on delivery in California: a deficiency of 60 tons in 420 having occurred on one occasion. At Newcastle, N.S.W., (70 miles north) the coal lies in heaps exposed to damp air and rainy weather, and for conveyance to Sydney is transferred into barges, the masters of which are not always attentive to the pumps. The dampness dries off during the passage across the Pacific; this accounts to a certain extent for the shortness of weight on delivery, but mates should be particular to see that the ship obtains from the barges the full quantity stated on the bills of lading.

159. Coal is liable to danger of two kinds totally different, although often confounded together; one is from spontaneous combustion, and the other the liability of ignition and explosion of the gas evolved from the coal, and remaining in the ship.

160. SPONTANEOUS COMBUSTION. Any coal containing a large quantity of iron pyrites is apt to heat when saturated with water, and after some time to burst into flame; the only prevention is said to be to keep the coal dry. Some kinds of coal are free from iron pyrites, and therefore not subject to spontaneous combustion.

161. IGNITION. Every kind of steam and other coal, especially when rapidly transferred from the mine to the ship, gives out carburated hydrogen gas or fire damp, which is explosive when mixed with atmospheric air, on the application of flame. This gas is peculiarly light, and is considered most explosive when mixed with nine times its volume of atmospheric air; with twelve times it will not ignite. If the hatches are fastened down directly the cargo is received, which is frequently done to keep out the rain or cold, or to prepare for sea, the gas finds its way from the coal to the spaces under the deck, and penetrates through the bulk-heads into the lazarette, cabin, and fore-castle, and when a match is lit, or a lighted candle exposed, especially in the lazarette, an explosion may take place and damage the decks, and jeopardize the lives of the crew. To avoid this let two funnels, 12 or 15 inches diameter, with moveable tops, be placed one forward, the other aft, communicating through the deck with the hold; keep a vacant space between the cargo and the beams. Turn the top of one funnel to the wind, the

other from it, a current of air will then conduct the explosive gas harmlessly out of the ship; this is said to be an effectual remedy. It has been also suggested that coal may be ventilated by building, with large lumps, two shafts communicating below; one with a wind-sail would act as a down-cast for fresh air, the other as an out-cast for foul air. In addition to this keep the hatches open 24 or 36 hours on all occasions, but especially when bound on long voyages, particularly to the southward.

162. Mr. MURRAY, when speaking of coal for engines says:—"the best method of prevention is to ensure perfect dryness in the coals when they are stowed in the bunkers, and to select a variety not liable to progressive decomposition." By the Queen's Regulations, 1862, captains of ships-of-war are instructed, in order to prevent accidents by fire from spontaneous combustion of coal, to see that the whole of the wood-work of the coal boxes, whether it form part of the side of the ship, or otherwise, be securely lined with iron or copper sheathing. He is to order the greatest care to be taken that the coal is never shipped wet; and that, when shipped, it shall be kept as dry as possible. Whenever a fresh supply is received on board, directions are to be given that the remainder in the coal boxes is, as far as may be practicable, so trimmed as to insure its being first used. The Admiralty will not permit coal to be shipped as cargo in a vessel conveying a large quantity of government powder, ammunition, or combustibles.

163. Excepting the Aberdare Valley and some other sorts, which are free from iron pyrites, brassey coal and steam coal, especially when damp, are, according to their chemical qualities, more or less liable to spontaneous combustion, and when coals from different pits are mixed the danger is said to be increased. Every ship laden with this class of combustible goods ought to have a safety lamp for exclusive use in the lower hold, and under the cabin floor; few accidents occur, except through neglect or ignorance. On the 12th of July, 1862, one of two labourers, TWINER and THORPE, struck a light in the hold of the coal-laden screw-steamer *Florence Nightingale*, at Hartlepool, when an explosion occurred. The two men were frightfully burnt, and a third man named MOONEY, who was descending the main hatchway, was thrown about three feet in the air, and fell on the deck; all the flesh was taken off his arms and breast. The steamer suffered no damage. On the 27th April, 1866, the cargo of Shotton gas coal ignited spontaneously on board the screw steam-vessel *Leipsic*, when near the mouth of the Humber, bound to Antwerp. Several of the crew were injured, and she returned to West Hartlepool.

**EXTRACT FROM REPORT ON SPONTANEOUS COMBUSTION
OF COAL CARGOES.**

By R. COOPER RUNDELL, Esquire, Liverpool.

164. The numerous fires which have been reported during the last two years, in vessels laden with coal, have again called attention to the subject of spontaneous combustion in coal cargoes, and the apparent increase in 1874 indicates a sudden and unforeseen alteration in the marine risk. This is a feature of especial interest to underwriters, and one to which I have given some attention, with a view to discover the probable cause, and afford means for estimating the increased risk. For this purpose I have (1) collected, as far as possible all the reported instances of heating and fire which have occurred during the last two years, (2) examined, where practicable, the special circumstances of each, and (3) compared the number of cases of heating which have occurred in vessels which have sailed during a certain period in 1873, with those which have occurred in vessels sailing during the same period in 1874. The periods selected have been the first nine months of each year, and the vessels those which have, during these periods, loaded 500 tons of coal or upwards, for ports south of the equator. The reason for the first restriction has been to allow time to ascertain the result of each sailing, and the reason for the two others has been that a preliminary investigation showed that the heating and fires chiefly occur in vessels with cargoes of 500 tons and upwards, and that a considerable time usually elapses before signs of heating are discovered. It is evident that satisfactory results could only be obtained by comparing for each period the number of casualties, with the total number of vessels sailing on similar voyages and carrying similar cargoes, and by comparing these again with each other.

An examination of the facts thus collected show :—(1) That in the cases selected for comparison, no fires occurred before the thirty-seventh day after leaving port ; while in one case there was no evidence of fire before the hundred and ninetieth day. The greater number of fires have, however, occurred about the sixtieth day. (2) That the fires have not been confined to one kind of coal, but have occurred in most, if not all, of the varieties which are usually exported. In fact, the inquiry supports the opinion that no kind of coal containing hydrogen has entire immunity from spontaneous combustion. (3) That fires occur in the cargoes, whether the coal be ventilated or not, whether loaded in summer or winter, by tip or

by basket. Among the instances are vessels ventilated by shafts through the coal, both horizontally and vertically; by vertical shafts only; and by means of platforms and side linings, which allow a circulation of air under the cargo from one end of the ship to the other. Some of the cargoes, also, are especially named as having been shipped in fine weather. It is probable, however, that there is a certain amount of moisture always present in all coal.

A comparison of the periods selected shows :—That in the first period, out of the 1,133 selected coal-laden vessels which sailed from the United Kingdom, there were twenty-three casualties from spontaneous combustion, or about 2 $\frac{1}{2}$ cent.; while in the second period, out of 1,240 sailings there were fifty casualties, or about 4 $\frac{1}{2}$ cent., thus showing an actual increase of just 100 $\frac{1}{2}$ cent.

Next, the sailings have been classified according to the districts from which the coal has been shipped, and a comparison made between the selected periods of 1873 and 1874. For this purpose I have adopted to a great extent, a classification of the coal ports already in use :—East Coast ports for North Country and Yorkshire coal; South Wales ports for South Wales coal; Liverpool and Birkenhead for Lancashire and North Wales coal respectively; and Scotch ports, both east and west, for Scotch coal. The facts brought out by this classification and comparison are shown by the following figures :—

(1) EAST COAST PORTS. Out of 258 sailings from the East Coast ports during the first period, there were thirteen casualties, or 4·85 $\frac{1}{2}$ cent.; while during the second period, out of 312 sailings, there were fifteen casualties, or 4·81 $\frac{1}{2}$ cent. This shows that, although in each year there is a high per centage of casualties in coal from the East Coast ports, the per centage has somewhat decreased in the second period. It is by the addition of the Yorkshire and London statistics, that the East Coast returns show a decrease in the per centage of casualties. If these be taken from the returns of the East Coast ports, the number of casualties for the first period will be about 4 $\frac{1}{2}$ cent., while for the second period it will be about 5 $\frac{1}{2}$ cent., thus showing an increase of 25 $\frac{1}{2}$ cent. The statistics for Yorkshire and London are as follows :—

Yorkshire ports	first period,	7 sailings,	3 casualties.
Ditto	second „	10 „	no casualties.
London.....	first „	22 „	3 casualties.
Ditto	second „	19 „	no casualties.

This large per centage of casualties in the first period as contrasted with none in the second period deserves investigation. Two of the

three, if not the whole of the casualties, in the Yorkshire district occurred in cargoes of the same kind of coal.

(2) SOUTH WALES PORTS. Out of 587 sailings from South Wales ports during the first period, there were seven casualties, or about 1·19 $\frac{1}{2}$ cent.; while during the second period, out of 589 sailings, there were 10 casualties, or 1·7 $\frac{1}{2}$ cent. This shows that in each period there has been but a small per centage of casualties in coal from the South Wales ports, but that the per centage has increased nearly 50 $\frac{1}{2}$ cent. in the second period.

(4) BIRKENHEAD. Here, while out of 120 sailings, from Birkenhead the first period, there were no casualties; during the second period, out of 133 sailings there were three casualties, or 2·27 $\frac{1}{2}$ cent.

(5) LIVERPOOL. In these shipments, out of 69 sailings from Liverpool during the first period, there were no casualties; while during the second period out of 109 sailings, there were thirteen casualties, or 11·9 $\frac{1}{2}$ cent.

(6) SCOTCH PORTS, east and west. Out of 89 sailings from Scotch ports, east and west, during the first period, there were three casualties, or 3·37 $\frac{1}{2}$ cent.; while during the second period, out of 97 sailings, there were nine casualties, or 9·28 $\frac{1}{2}$ cent.

This shows that while the per centage of casualties in the coal from the Scotch ports is high in each period, it has increased in the second period nearly threefold. The statement of these facts, not only forcibly demonstrates a large increase in these casualties, but also that the increase is not confined to any special district, and that in the short space of twelve months, one district, previously almost free from such casualties, now shows casualties from fire amounting to nearly 12 $\frac{1}{2}$ cent. This leads to the inquiry, does this increase arise (1) from any change in the mode of shipment, size of cargo, or extent of ventilation; or (2) from any alteration in the quality or condition of the coal shipped? There is no reason to believe that during the periods in question there has been any change in the mode of shipment, or of ventilating the coal, or any decided change in the general size of the cargoes. One is, therefore, led to conclude that there must be an alteration either in the character of the seams worked, or in the condition of the coal shipped. As far as I am informed, however, no noticeable change has taken place in the character of the seams worked during the two periods; but it is stated that certain old seams which had not been worked for some years have been again brought into use. It may, therefore, be inferred that the change is owing to a difference of condition.

For the last two years there has been a great increase in the cost of labour, and consequently there has been an inducement to curtail, as far as possible, all labour beyond that required to get and deliver the coal. The Coal Mines Regulation Act, 1872, 35 and 36 Vic, c. 76, which came into force, January 1st, 1873, has also made one source of cheap labour less available. By this act, children are not allowed to work at the mine except under certain restrictions, which have had the effect of gradually removing a great many of those who were formerly employed in cleaning and selecting the coal, and the remainder of the children, I am told, have thus been able to secure an increase in their wages of nearly 100 per cent. There has also been a great demand for coal, and a ready sale has been found for inferior and unclean sorts, which would not formerly have been marketable. The pitman, it is stated, would have been fined for sending up so much bad stuff; and the stony and metallic part of the coal which did come up, would be carefully separated at the pit's mouth. Now, the coal agent, in order to meet the demand, appears to accept anything passed to him, as he meets with a ready market for it. And, in some cases, even where the precaution of ordering a particular kind of coal has been adopted, some uncertainty has existed whether the whole of the shipment was of the exact kind agreed for. It was naively remarked to me by a shipper who had seen a cargo of coal which subsequently caught fire, that he was surprised to hear of the casualty, as the coal was such rubbish that he did not think it would have caught fire if fire had been put to it. I have further heard of masses of small coal, pasty from moisture, being brought for shipment, and that in one case a careful captain actually refused to ship the coal which was brought alongside his vessel for this purpose. It has been observed also that the heaps of slack, which were formerly a noticeable feature in coal-yards, have for some little time past quite disappeared.

The following remarks by Capt. HEATHCOTE, in his report to the London Salvage Association, on coal shipped from **Swansea** for the west coast of South America, bear closely on this branch of the subject, and if they were applicable in 1866, when he wrote, how much more must they apply to the circumstances present in 1874 :—"The miner sends to the surface coal from any vein he is ordered to work, and in time of extraordinary demand produce will be drawn from strata which, in the absence of such pressure, would be considered undesirable. The comparative freedom from dangerous qualities of the coal of one vein from that of another is well-known to the coal owner, either from actual experience or from private analysis; and

when supplying coal to be carried to a distant part of the world, he will, no doubt, if possible, avoid sending the more dangerous, and this I believe is the general practice; but urgency of demand may force, and in some recent cases has forced the coal owner to supply a proportion of the shipment from a vein which experience has shown to be less adapted to a long sea voyage; and in like manner, the exigencies of trade may induce a merchant to accept a supply which would otherwise be declined, as coming avowedly from a vein of at least doubtful quality, so far as regards comparative tendency to heat."

Another circumstance supposed to effect condition is freshness from the mine. It has been observed that the coal shipped in 1874 was probably fresher from the mine than that shipped in 1873. This is possibly to some extent true, as in the beginning of 1873 reserves of coal were available, while no such reserves existed in 1874. In the latter period, the coal intended for export has no doubt been sent to the ship as soon as won from the mine. How far this may cause an increased number of cases of combustion in 1874 is certainly matter for discussion. The statistics, which I have prepared, show a larger per centage of casualties at about sixty days from the date of sailing in 1874, but they also show that in neither year did the fires occur until the vessels had been at sea about forty days.

The next feature affecting condition is dampness. As to the influence of weather on the coal shipped, there is no reason for supposing that the season of 1874 was damper than that of 1873. For, taking in each year the three months July, August, and September, when most of the coal cargoes affected by fire were shipped, there appears to have been no appreciable difference in the amount of rainfall in North and South Wales during these two periods, while in Lancashire and Yorkshire, Northumberland and Scotland these months were decidedly drier in 1874 than in 1873. Again, it is evident that the more rapidly the coal goes from the mine to the ship, the less chance of its absorbing moisture from rainfall, although, it must not be forgotten that if the coal comes wet from the mine it has not the opportunity for drying. It cannot, therefore, be supposed that the increase in the number of fires in 1874 has arisen from a greater rainfall. It must, nevertheless, be remarked that, as Capt. HEATHCOTE has correctly stated in the report already referred to, a large amount of moisture is not required to produce spontaneous combustion. It is also a noteworthy fact, that while there is moisture in the coal, the danger from spontaneous combustion is present, however much you may be able to close up the coal from the action

of the atmosphere. The decomposition of the water which takes place in damp coal affords a much larger amount of oxygen, for the purpose of combustion, than the air contained in the hold of the vessel does, as a cubic foot of water contains more oxygen than 3,000 cubic feet of atmospheric air. This fact seems to be overlooked by those who propose the introduction of carbonic acid gas as a means of preventing spontaneous combustion. It is stated that about 2 per cent. less small coal passes through the screens when the coal is damp than when it is dry. While, therefore, dampness is no doubt a necessary element for the fires, the whole of the facts collected point to a larger shipment of small and unclean coal as the chief cause for the increase in the number of fires.

It is well next to briefly indicate, at the risk of repeating what is well-known, how the shipment of small and unclean coal influences spontaneous combustion. Previous reports, and particularly one prepared so long ago as 1846 by Sir HENRY DE LA BECHE and Dr. LYON PLAYFAIR on steam coal for the Royal Navy, leave no doubt as to the cause of spontaneous combustion in coal cargoes. In fact successive reports, in a great measure, repeat the same warnings and point out the same precautions. When a vegetable body is exposed to the action of water decomposition ensues, and a certain amount of heat is generated. The heating of hay, where it has been stacked in a damp state, is a familiar example of the action on shore, while the heating of damp cotton and grain is known to underwriters and merchants to be not uncommon at sea. The same effect is produced in coal. All coals, even at ordinary temperatures, are uniting more or less rapidly with the oxygen of the atmosphere, and thus undergoing slow decay. The heat, however, which is thus generated, is not as a rule sensibly appreciable unless under favourable conditions. These are (1) a finely divided state of the coal, so as to increase, to a large extent, the surface exposed to oxidation, and (2) the coal being stowed so that the heat generated is very slowly conducted away. Imperfect ventilation is certainly favourable to this last condition. As the heat is slowly generated slight differences in ventilation, and even in external temperature, will sensibly affect its accumulation. This is shown by the fact, that by far the greater number of cases of heating have occurred in vessels which have sailed during the summer, and on voyages where the summer heat is retained and increased.

If the cases of heating be examined, it will be found that in many of them these favourable conditions were probably present. Some of the vessels in which this occurred were large ships with deep holds, and some had also no laid lower deck. Others were foreign vessels

which have not the hatch accommodation of English ships, and are awkward for trimming. Each of these facts will tend to the increased breakage of the coal, and consequently add to the amount of small coal already spoken of as being sent from the mine. The small naturally lies immediately under the hatches, while the large coal rolls to the sides and ends of the ship, and it is a significant fact that the fires are found to chiefly originate beneath the hatches. It must also be remembered that the small coal absorbs proportionately the most moisture, so if the coal has been at all exposed to rain, or been worked from a wet seam, this is the part of the cargo most likely to retain it. The investigation, therefore, leads step by step to the conclusion that the increased number of casualties from spontaneous combustion proceeds from the condition in which the coal has been shipped, and there can be little doubt that the cargoes shipped in 1874, were not so free from pyrites or from small coal as in preceding years.

The remarks of a Marseilles correspondent, with regard to the number of fires which occurred in the latter half of 1874 in shipments from that port, further indicates that the causes for the increase here indicated are not confined to coal from the United Kingdom. French underwriters have successfully pleaded in some of these cases that they are not liable under their policies.

The number of missing vessels, carrying 500 tons of coal and upwards, which have sailed from the United Kingdom, for ports south of the Equator, during the periods in question is not large, and particulars are recorded of some of these vessels which make it probable that they either foundered at sea or were wrecked. Possibly three in the first period and four in the second period may have been lost by fire. The addition of these to the totals will not materially affect the averages which have already been given.

165. Continental Ports. Owing partly to the difference between the mode of weighing and measuring coal in some continental ports and that which prevails in Great Britain, frequent disputes arise. It is suggested that British Consuls should be provided with British standard weights, and that they should be bound, on the application of shipmasters, to test the foreign weights and measures employed. The Sunderland Shipowners' Society, in its report for 1863, says:—"It is well known to shipowners who have sent their vessels to French, Spanish, and Italian ports, laden with coal, that the bill of lading quantity is, by some contrivance or other, made to control the quantity discharged, and on which the freight is made payable; and it is equally well known that the bill of lading quantity is generally

far below the quantity actually put on board. Two interests are thus defrauded: the Commissioners of the River Wear are not paid so much in dues as they ought to be paid; and the shipowners are not paid their agreed freight."

166. **France.** When delivering coal at **Havre, Dieppe**, and at **Rouen** especially, where the cargoes go into railway trucks, English masters complain that they have great difficulty in ascertaining the quantity delivered, and there are frequent disputes with the consignees. To meet this difficulty, Messrs. NEVILLE & Co., of Llanelly, allow $2\frac{1}{2}\%$ cent. additional on all coal sent to French ports. One master states, May 22, 1860:—"most ships bound to France are chartered to deliver 290 hectolitres coal per keel, and masters take it for granted that 290 hectolitres make a keel. However, instead of delivering 21½ tons per keel they deliver about 24 tons, weighing on an average 83 to 84 kilogrammes." An owner adds May 25th:—"I have had ships at **Bordeaux**, but was always paid at the rate of 252 hectolitres, which is fair." A French merchant writing June 15th, says:—"the rate of 290 hectolitres means hectolitres *ras* (straight or streak measure). At Bordeaux the 252 hectolitres are for hectolitres *combles* (heap or full measure). As a practical man I can warn English masters that the average rate at that port, when coal is loaded in England of good ordinary size, is always 256 hectolitres *combles* per keel. M. ROUHER, Minister of Commerce, in writing to the merchants or **Marseilles**, February 24th, 1862, states:—"that some French masters, on arriving at their port of destination, found that by some inexplicable deficiency, they could not deliver the quantity of coal stated in the bills of lading at Cardiff and Swansea." One master had inserted in his charter-party that freight was to be paid on the quantity declared in the bill of lading, but he took care to sign only for the quantity received. He would not commence unloading until this condition was accepted by the consignee. Mons. ROUHER adds:—"That in case shippers should refuse to subscribe to this arrangement, fearing that a part of the cargo might have been cast into the sea, masters might offer to prove that the hatches had not been opened, unless in case of injury by bad weather, when the loss could be regulated according to law." Mr. PEMBERTON, British Consul, at **Caen**, writes 30th April, 1858:—"Where the loading is by the Newcastle chaldron, freight (unless there are conditions to the contrary) is paid at Caen on quantity delivered, taking 32 hectolitres of large, and 33 hectolitres of small coal, as the equivalent to the chaldron. It ought to be understood that these proportions—viz., the 32 and 33 hectolitres—are not the real equivalents: and that masters should not accept this basis, unless they are to receive a considerable reduction on the amount of their freight. Ships thus freighted invariably deliver a lesser quantity than that which is mentioned in the bill of lading. A ship, supposed to have taken on board 65 chaldrons, has, by the calculation of 32 hectolitres, lately delivered 6 chaldrons less. All differences might be avoided if coal was shipped by the ton of 1,015 kilogrammes, or by the keel, giving in weight 21 tons 4 cwt. as 21,540 kilogrammes."

167. **Spain.** One master complains, January, 1863, "that his vessel was laden with 682 tons of steam coal, for which at a Spanish port he was offered consular documents for 442,909 kilogrammes, which at 1,015 kilogrammes to the ton, showed a total only of 436 tons." Another master writes, same date, "that his vessel being laden for a Spanish port, he called at the shipper's office, where he was offered consular notes for clearing at the rate of 25 quintals to the tonnage

per register, instead of 22 quintals to the cargo." Capt. W. TODD, of the barque *Bonita*, of Galway, writes, "that when he delivered at **Malaga**, December, 1862, a cargo of 100 tons of iron and 400 tons of coal, the merchant first said there were 17 tons of coal short and then 5 tons, on which deduction settlement was made, the tribunal being too slow for Capt. TODD to wait. His coal was discharged into lighters and weighed when landed; in consequence of the surf, the lighters are sometimes detained afloat two or three days, during which time it is very probable that pilfering occurs." Capt. TODD recommends a protecting clause in the charter-party. In August, 1863, an owner complained that on discharging coal from his ship at **Alicante**, the cargo made out 11 tons 14 cwt. short. When the vessel loaded at Swansea, the shippers insisted on the master signing bills of lading for weight, of which he could form no opinion there, as he could judge only by the ship's immersion, and if there was much fresh water in the dock, he might be deceived. At Alicante, cargo is weighed by the weigh-bridge of the railway company, on the correctness of which the master must rely. It is said that some vessels turn out 20 tons short; small vessels 4 tons and upwards; one barque is reported to have made out 40 tons short on coal and 30 on coke, although in the North Country coal trade there is on an average 2 to 3 $\frac{1}{2}$ cent. overweight. Deductions of from 1 to 5 $\frac{1}{2}$ cent. are sometimes attempted for alleged dampness of cargo. Great complaints are made by masters when discharging coal at **Mataro**, in the south of Spain. The cargo is usually supplied to a number of small consumers, so that it is impossible for the master to hold the lien for payment of freight and demurrage. The demurrage is excessive and legal proof of it is difficult. In April, 1864, the *Lord Riversdale* loaded 131 launches of the largest size, yet they averaged only 4 tons 7 to 8 cwt. each, while those loaded (small launches) from the *Britannia* averaged only 4 tons 13 cwt. Nevertheless, by the general account, each ship delivered just an equal per centage short (30 tons) of which 26 tons was patent fuel, in square blocks, and every block was delivered to the consignee. **Seville**. A master complains, 31st March, 1865, that 236 tons of Welsh coal weighed out only 217 tons at Seville.

168. **Portugal**. The expenses of discharging a cargo of coal from a British vessel 212 *o.m.*, 207 *n.m.*, and measuring 204 at **Oporto**, were—duty on 366 $\frac{1}{2}$ tons at 200 *rs.* $\frac{1}{2}$ ton, 73 *mr.* 300 *r.*; to emoluments, at 3 per cent. 2 *mr.* 200 *r.*; to custom-house measurement on board, 7 *mr.* 720 *r.*; attending ditto and sorting, 7 *mr.* 900 *r.*; and commission on sale, at 3 $\frac{1}{2}$ cent., 32 *mr.* 544 *r.*; total 123 *mr.* 664 *r.*; exchange 54 $\frac{1}{2}$ d. $\frac{1}{2}$ real.

169. **Italy**. Coal is weighed by steelyards and as there is a Government import duty, importers are strongly interested in obtaining as great a weight from the steelyards as possible. This interest is manifestly adverse to that of the ship, and the entire arrangement requires great prudence of the master; frauds have sometimes been detected. At **Naples**, vessels of 400 tons burthen have it is said, put out their cargoes of coal short of weight from 20 tons up as far as 100 tons. In 1864, the brig *Thomas Rowell*, of South Shields, 400 tons burthen, was 45 tons short; *Jordan*, of Sunderland, 27 tons short; and the *Julia*, of Liverpool, 1,300 tons, 96 tons short. A meeting of English masters, including P.W.KIDD, HOOKS, HUTCHINSON, RAMSEY, LAWRENSEN, JOHNSON, ALEXANDER, GOULD, INGRAM, and G. S. HEMSLEY, Chairman, took place at Naples in April, 1864, when one of the resolutions passed was "that it is unjust that lay-days do not commence until the ship has been berthed three days; that the mode of weighing coal by steelyards is unjust and fraudulent; that, in reference to the exchanges, the mode of settling

freight is unfair; and, that the mode of ballasting is unfair." It is said that 15 cwt. only of ballast is given as a ton. **Venice.** Capt. OMHOLT, Norwegian barque *Bond Fide*, writes, 2nd February, 1867: "I beg to call your notice to the interpretation which is given here to certain clauses in the charter, 'one keel and a half per working day, weather permitting.' Here they reckon only calm, sunshiny days as working days, and it goes very slowly indeed with the discharging. 'The freight to be paid in cash at the current rate of exchange,' ought to be simply 'the freight to be paid in cash,' as you are otherwise obliged to take paper money. It is strange, but such is the Venetian interpretation, that when it stands merely 'cash' it is understood here freight is to be paid in sterling, or the value thereof."

170. Egypt. In the course of a trial in the Sunderland County Court, before Mr. STAPVLTON, 27th September, 1866, it transpired that there existed a practice at **Alexandria** for masters of coal-laden vessels to make presents to the meters, in one case of £10 for a vessel registering 296 tons. It was stated that unless these presents were given, the cargo would not make out according to the bill of lading, and that if given 10 to 30 tons of coal would be left on board. This was used to stiffen the ship and for dunnage when loading seed, &c. Sometimes the coal was given to the steam-tugs for towage through the Bosphorus.

171. American Measures. The ordinary estimate of bituminous coal is 28 bushels=1 ton of 2,240 lbs.; occasionally it has been customary to allow 30 bushels=1 ton of 2,240 lbs.; some places in the *West*, 26½ bushels=1 ton of 2,240 lbs. At the *Richmond* pits 5 pecks make a bushel; when put on board 4 pecks; at the pit's mouth a bushel is considered to weigh 90 lbs.; 24 bushels and 80 lbs. go to a ton. The four-peck bushel weighs 72 lbs., and 31 of these and 8 lbs. go to a ton. In the *South* bituminous coal is sold @ ½ barrel, 172½ lbs. there are therefore 13 barrels to a ton. In the *Anthracite* trade the prevailing standard is 2,240 lbs.; occasionally in retailing the ton is only 2,000 lbs.; it is so quoted at *New York, Cleveland, &c.* On the *State Canal* and the *Tide-water Canal* the toll is levied @ ½ 1,000 lbs. In *Pensacola, Mobile, and New Orleans*, 13 barrels (2½ bushels each) go to a ton. A bushel, measured when dry, weighs 84 or 85 lbs.; but in *Pennsylvania, in Ohio, at Cleveland*, and several other places, the bushel is equivalent to 80 lbs. Foreign bituminous coals are, or were, commonly sold by the chaldron of 36 bushels; a chaldron of these coals weighs 25½ cwt. What used to be sold under the denomination of a Newcastle chaldron, weighed 2 tons 13 cwt.; the *Boston* retail chaldron is commonly 2,500 lbs., but sometimes 2,700 lbs.; the tariff duty was levied on the chaldron of 2,880 lbs., or 36 bushels of 80 lbs. each; the *Nova Scotia* chaldron is 1½ tons or 3,360 lbs., or 42 bushels of 80 lbs. each; but the measurement yields 48 bushels. Sometimes it is 2,928 lbs.—*Taylor's Statistics.*

172. Foreign Measures. *Austria*, cental or cwt. of Austria or Vienna=123½ lbs. English=18·2 to 1 ton English; Vienna lb. 1·235 lb. avoirdupois. *France*, 1 cwt. (112 lbs.)=50·7824600 kilogrammes; 1 ton (20 cwt.)=1,015·6490 kilogrammes. 1 kilogramme (2·20548 lbs.)=2 lbs. 3 ozs. 4½ grains avoirdupois. *Portugal*. The commercial weights are 8 ozs.=1 marc; 2 marcs=1 lb. or arratel; 22 lbs.=1 arroba; 4 arrobas=1 quintal. 100 lbs. or arratels of Portugal=101·19 lbs. avoirdupois. *Prussian* tonne of coal=4 quintals, or centers, or scheffels of about 110 lbs.=113·38 lbs. avoirdupois, that is nearly 5 Prussian tonnes to 1 English ton; Prussian scheffel or boisseau, about 20 weigh 1 ton. A *Danish* last of coal is 6,000 lbs. *Russian*, 1 pood, pud, or poud=36 lbs. 11 dr. English; sometimes 40 Russian lbs. to 1 pood, 110 lbs. Russian=100 lbs. English. *Spain*, quintal of Asturians 69 kilogrammes=155 lbs. avoirdupois; 14·5 quintals 1 ton English, of

Catalonia 91 lbs. ; of Castille=46 kilogrammes, 10 grammes=101 lbs. English=100 lbs. Spain ; 100 lbs. Barcelona=82·215 lbs. avoirdupois. *Swedish* tonne is=1 hectolitre=5,565 decimes ; 1 English ton 11·26 hectolitres ; 7·21 Swedish tonnes to 1 English ton. *Chile*, 1 quintal=4 arrobas=100 lbs., 1 arroba=25 lbs., 1 lb.=2 marcs=16 oz., 1 ton=2,000 lbs.

Proportionate Tonnage. At Newcastle and in the North 20 cwt. or 10 large sacks contain 1 ton ; 21 tons 4 cwt. 1 barge or keel ; a keel consists of 8 waggons of 53 cwt. or 126 cubic feet each, and is therefore 1,008 feet, but when compressed in the hold will stow in a space of 850 cubic feet, which is at the rate of 40 feet per ton ; by the same rule 14·96 tons of coal make 15 tons bulk, thus showing that the weight and bulk of coal in nearly equal. A vessel of 220 tons register should carry 329 tons of coal. 11 tons of coke will occupy the same space as 21 tons 4 cwt., or 1 keel of Newcastle coal.

Measurement. A ton of Boghead Parrot measures nearly 50 cubic feet. A ton of Liverpool measures 45 to 50 feet. The Admiralty computes 46 cubic feet of space for stowing each ton of coal for cooking purposes in the navy.

Tonnage for Freight. In Wales the ton is 20 cwt. At New York 29 bushels sea-coal ; at Baltimore 30 bushels ; Philadelphia 2,000 lbs. ; in Germany a seidel is 4 bushels ; a Bremerhaven last is 12 barrels or 2 chaldrons ; Lisbon balde 12·70 bushels. At Valparaiso a ton is 2,240 lbs. An Irish barrel of culm is 24 cwt. When wheat is freighted at 1s. $\frac{1}{4}$ quarter, coal is rated at 4s. 7d. $\frac{1}{4}$ ton.

A Chaldron. The Newcastle chaldron consists of 3 wains of 52½ cwt., but for boats it is estimated at 53 cwt. ; in London 52½ cwt. In the transatlantic ports the coal chaldron varies : At Pictou, N.S., it is nominally 1½ tons, but the average weight is 3,456 lbs. in the United States the weight ordinarily required is 2,940 lbs., but at New York the chaldron is only 2,500 lbs.

SPECIFIC GRAVITY OF VARIOUS KINDS OF STEAM-ENGINE COAL.

<i>Welsh</i> Anthracite	1·375	<i>Scotch</i> Dalkeith Jewel Seam	1·277
Ebbw Vale	1·275	Do. Coronation Seam	1·316
Binea	1·304	Wallsend, Elgin	1·20
Duffryn	1·326	Fordel Splint	1·29
Pentraferlin	1·358	Grangemouth	1·29
Graigola	1·30	<i>English</i> Broomhill	1·25
Pontypool	1·32	Parkend, Syding, }	1·283
½ Rock Vein	1·34	Forest of Dean }	
Coleshill	1·29	<i>Irish</i> Slievardagh	1·59

Under the article patent fuel will be found Sir HENRY DE LA BECHE and Dr. LYON PLAYFAIR's report on the weights, &c., of steam coal.

Specific Gravities. The specific gravities of the various seams of the same coal differ most materially. The following were obtained from Newcastle, May 14, 1864 :—Pearth coal 1·297, Marley Hill 1·314. Marley Hill coke 1·140. The average weight of Wallsend is stated to be 78·945 lbs. per cubic foot ; specific gravity 1·263. Coalbrook dale (Shropshire) 1·268 ; East Lothian (Edinburgh) 1·329 ; and Kilmarnock blind coal or anthracite 1·60. According to URE Scotch 1·300, Newcastle 1·270, Staffordshire 1·240 ; and Cannel 1·238. The specific gravity of POWELL's Duffryn steam coal is 1·326, and the mean weight of a cubic foot is 53·22 lbs. See page 136.

SPECIFIC GRAVITIES OF VARIOUS KINDS OF COAL.

(R. C. TAYLOR'S Coal Statistics, Philadelphia, 1848.)

AMERICA.			S. WALES—ANTHRACITES.		
Tennessee	1'450		Ynis Cedwin	1'336 to	1'372
Kentucky	1'250		Welsh Stone		1'368
Do.	1'392		Welsh Slaty Stone.....		1'409
Pennsylvania	1'319 to	1'750	Mean of several Welsh Coals		1'354
Maryland	1'291 to	1'584	IRELAND—BITUMINOUS.		
Ohio	1'264 to	1'560	<i>Dry or slightly dry.</i>		
PENNSYLVANIA.			Kilkenny.....		1'602
Anthracite ..	1'371		Do. Slaty or Cannel ...		1'445
Rhode Island	1'770 to	1'850	Boolavoonen Stone		1'346
Massachuset	1'690 to	1'780	Corgee do.		1'403
			Queen's County		1'403
BITUMINOUS.			BELGIUM—BITUMINOUS.		
Indiana	1'219 to	1'272	Hainault	1'270 to	1'307
Illinois	1'273 to	1'340	FRANCE—BITUMINOUS.		
Iowa	1'270		Montet.....		1'38
Missouri ..	1'250		Doyet.....		1'30
Arkansas.....	1'396		Haute-dordagne.....		1'34
MISCELLANEOUS.			Auvergne	1'30 to	1'45
Cuba	1'190		Guinguette	1'310 to	1'340
Chili	1'324		Haute-sahone		1'40
Brazil	1'289 to	1'483	Rhone	1'288 to	1'315
Nova Scotia ..	1'318 to	1'325	GERMANY.		
Cape Breton	1'318 to	1'338	Gustaw Grube		1'270
ENGLAND AND SCOTLAND.			Saxon States		1'288
Alfreton	1'235		Prussian Saxony.....		1'466
Butterley	1'264		Germany		1'300
Derby Cannel.....	1'278		Saxony Pottschapel		1'454
Wigan Cannel	1'274		Planitz		1'860
Glasgow Cannel.....	1'228		Westphalia	1'336 to	1'358
Liverpool Coal	1'260		ASIA.		
Coalbrook Coal.....	1'610		Bengal Chirrapoonjee		1'447
			Assam Kosya		1'275
			Delhi		1'368
			Arracan		1'308

SPECIFIC GRAVITY OF VARIOUS KINDS OF COAL.

Wales—average 36 samples	1'315	Davison's Hartley ..	1'25
Newcastle — 18 —	1'256	Derwentwater Hartley	1'26
Lancashire — 28 —	1'273	Broomhill	1'25
Scotland — 8 —	1'295	Cowpen & Sydney's Hartley	1'26
Derbyshire — 7 —	1'292	FOREIGN COAL.	
Haswell's Wallsend ...	1'28	Borneo (Labuan kind)	1'28
Newcastle Hartley	1'29	— 3-feet seam	1'37
Hedley's Hartley	1'31	— 11-feet	1'21
West Hartlepool Main	1'26	Formosa Island	1'24
Hasting's Hartley	1'25	Conception Bay	1'29

RELATIVE PRICES OF COALS.

THE TON, 20 cwt.—THE IMPERIAL CHALDRON, 25½ cwt.—THE NEWCASTLE
CHALDRON, 53 cwt.

TON.	Imperial Chaldron.	Newcastle Chaldron.	TON.	Imperial Chaldron.	Newcastle Chaldron.	TON.	Imperial Chaldron.	Newcastle Chaldron.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1 0	1 3'30	2 7'80	11 0	14 0'30	29 1'80	21 0	26 9'30	55 7'80
1 3	1 7'12	3 3'75	11 3	14 4'12	29 9'75	21 3	27 1'12	56 3'75
1 6	1 10'95	3 11'70	11 6	14 7'95	30 5'70	21 6	27 4'95	56 11'70
1 9	2 2'77	4 7'65	11 9	14 11'77	31 1'65	21 9	27 8'77	57 7'65
2 0	2 6'60	5 3'60	12 0	15 3'60	31 9'60	22 0	28 0'60	58 3'60
2 3	2 10'42	5 11'55	12 3	15 7'42	32 5'55	22 3	28 4'42	58 11'55
2 6	3 2'25	6 7'50	12 6	15 11'25	33 1'50	22 6	28 8'25	59 7'50
2 9	3 6'07	7 3'45	12 9	16 3'07	33 9'45	22 9	29 0'07	60 3'45
3 0	3 9'90	7 11'40	13 0	16 6'90	34 5'40	23 0	29 3'90	60 11'40
3 3	4 1'72	8 7'35	13 3	16 10'72	35 1'35	23 3	29 7'72	61 7'35
3 6	4 5'55	9 3'30	13 6	17 2'55	35 9'30	23 6	29 11'55	62 3'30
3 9	4 9'37	9 11'25	13 9	17 6'37	36 5'25	23 9	30 3'37	62 11'25
4 0	5 1'20	10 7'20	14 0	17 10'20	37 1'20	24 0	30 7'20	63 7'20
4 3	5 5'02	11 3'15	14 3	18 2'02	37 9'15	24 3	30 11'02	64 3'15
4 6	5 8'85	11 11'10	14 6	18 5'85	38 5'10	24 6	31 2'85	64 11'10
4 9	6 0'67	12 7'05	14 9	18 9'67	39 1'05	24 9	31 6'67	65 7'05
5 0	6 4'50	13 3'00	15 0	19 1'50	39 9'00	25 0	31 10'50	66 3'00
5 3	6 8'32	13 10'95	15 3	19 5'32	40 4'95	25 3	32 2'32	66 10'95
5 6	7 0'15	14 6'90	15 6	19 9'15	41 0'90	25 6	32 6'15	67 6'90
5 9	7 3'97	15 2'85	15 9	20 0'97	41 8'85	25 9	32 9'97	68 2'85
6 0	7 7'80	15 10'80	16 0	20 4'80	42 4'80	26 0	33 1'80	68 10'80
6 3	7 11'62	16 6'75	16 3	20 8'62	43 0'75	26 3	33 5'62	69 6'75
6 6	8 3'45	17 2'70	16 6	21 0'45	43 8'70	26 6	33 9'45	70 2'70
6 9	8 7'27	17 10'65	16 9	21 4'27	44 4'65	26 9	34 1'27	70 10'65
7 0	8 11'10	18 6'60	17 0	21 8'10	45 0'60	27 0	34 5'10	71 6'60
7 3	9 2'92	19 2'55	17 3	21 11'92	45 8'55	27 3	34 8'92	72 2'55
7 6	9 6'75	19 10'50	17 6	22 3'75	46 4'50	27 6	35 0'75	72 10'50
7 9	9 10'57	20 6'45	17 9	22 7'57	47 0'45	27 9	35 4'57	73 6'45
8 0	10 2'40	21 2'40	18 0	22 11'40	47 8'40	28 0	35 8'40	74 2'40
8 3	10 6'22	21 10'35	18 3	23 3'22	48 4'35	28 3	36 0'22	74 10'35
8 6	10 10'05	22 6'30	18 6	23 7'05	49 0'30	28 6	36 4'05	75 6'30
8 9	11 1'87	23 2'25	18 9	23 10'87	49 8'25	28 9	36 7'87	76 2'25
9 0	11 5'70	23 10'20	19 0	24 2'70	50 4'20	29 0	37 1'70	76 10'20
9 3	11 9'52	24 6'15	19 3	24 6'52	51 0'15	29 3	37 5'52	77 6'15
9 6	12 1'35	25 2'10	19 6	24 10'35	51 8'10	29 6	37 9'35	78 2'10
9 9	12 5'17	25 10'05	19 9	25 2'17	52 4'05	29 9	37 11'17	78 10'05
10 0	12 9'00	26 6'00	20 0	25 6'00	53 0'00	30 0	38 3'00	79 6'00
10 3	13 0'82	27 1'95	20 3	25 9'82	53 7'95	30 3	38 6'82	80 1'95
10 6	13 4'65	27 9'90	20 6	26 1'65	54 3'90	30 6	38 10'65	80 9'90
10 9	13 8'47	28 5'85	20 9	26 5'47	54 11'85	30 9	39 2'47	81 5'85

NEWCASTLE STATUTE COAL MEASURE CONVERTED INTO WEIGHT,

AND COMPARED WITH THE REGISTER TONNAGE, N.M., OF SHIPS SHEWING THE
NUMBER OF CHALDRONS, TONS, OR KEELS OF COAL A VESSEL WILL CARRY AT
THE RATE OF 14 REGISTER TONS PER KEEL.

Chals.	Tons.	Cwt.	Keels.	Reg. Tons. N.M.	Chals.	Tons.	Cwt.	Keels.	Reg. Tons. N.M.	Chals.	Tons.	Cwt.	Keels.	Reg. Tons. N.M.
1	2	18	1	14	128	339	4	16	224	296	784	8	37	519
2	5	6	2	28	186	360	8	17	238	304	806	12	38	532
3	7	19	3	42	144	381	12	18	252	312	826	16	39	546
4	10	12	4	56	152	402	16	19	266	320	848	0	40	560
5	13	5	5	70	160	424	0	20	280	328	869	4	41	574
6	15	18	6	84	168	445	4	21	294	336	890	8	42	588
7	18	11	7	98	176	466	8	22	308	344	911	12	43	602
8	21	4	8	112	184	487	12	23	322	352	932	16	44	616
9	24	8	9	126	192	508	16	24	336	360	954	0	45	630
10	27	12	10	140	200	530	0	25	350	368	975	4	46	644
11	30	16	11	154	208	551	4	26	364	376	996	8	47	658
12	33	5	12	168	216	572	8	27	378	384	1017	12	48	672
13	36	19	13	182	224	593	12	28	392	392	1038	16	49	686
14	39	8	14	196	232	614	16	29	406	400	1060	0	50	700
15	42	12	15	210	240	636	0	30	420	408	1081	4	51	714
16	45	16	16	224	248	657	4	31	434	416	1102	8	52	728
17	48	5	17	238	256	678	8	32	448	424	1123	12	53	742
18	51	19	18	252	264	699	12	33	462	432	1144	16	54	756
19	54	8	19	266	272	720	16	34	476	440	1166	0	55	770
20	57	12	20	280	280	742	0	35	490	448	1187	4	56	784
21	60	16	21	294	288	763	4	36	504	456	1208	8	57	798

NOTE. The burthen of vessels varies according to their form; the above Table, however, will be found correct from 100 to 306 tons register. When below 100, and not less than 56 tons, about one-half keel will require to be added to the burthen above stated. When 300 to 400 tons register, about one-half keel; or if 400 to 800 tons register, 1 to 3 keels must be subtracted from the corresponding number above, according to capacity of ship.

COAL PORT CHARGES. &c., SOUTH WALES.

Cardiff.

East Bute Dock, 43 acres; depth 25 feet.

West Bute, 20 acres; depth 19 feet. Ships drawing under 21 feet, when loaded, can be filled up in the West Dock Basins.

Glamorganshire Canal Dock, 12 acres; depth 9 to 15 feet.

DOCK DUES ON SHIPPING. COASTING: under 100 tons reg., 2d. $\frac{1}{2}$ ton; above 100 and under 200, 3d.; above 200 4d.

FOREIGN: Between the North Cape and Finisterre, 5d. For any other port in Europe and Mediterranean, 7d.; out of Europe 9d. Vessels loading steam coal pay 2d. $\frac{1}{2}$ ton dues on cargo.

WHARFAGE. Coal or coke 2d. $\frac{1}{2}$ ton.

Average depth West Bute: Spring 28 ft. 8 in.; Neaps 18 ft. 7 in. Depth at East Bute, 3 feet more than West Dock.

Vessels under 200 tons reg. can be loaded in the Glamorganshire Canal, and in the Tidal harbour, where the expenses are less.

PILOTAGE ON SHIPPING. HARBOUR PILOTAGE between any dock or harbour in the port of Cardiff, and any point in the Cardiff Roads, viz. :—

	£	s.	d.		£	s.	d.
If under 60 tons	0	5	6	400 and under 500	1	5	0
60 and under 100	0	7	6	500 „ 600	1	7	6
100 „ 150	0	10	0	600 „ 800	1	10	0
150 „ 200	0	12	6	800 „ 1,000	1	15	0
200 „ 250	0	15	0	1,000 „ 1,250	2	10	0
250 „ 300	0	17	6	1,250 and upwards	3	0	0
300 „ 400	1	1	0				

CHANNEL PILOTAGE. Any vessel from or to port of Cardiff, upon waters of Bristol Channel between Lundy Island and Kingroad, shall pay :—

Vessels.	1st Limit.	and Limit.	3rd Limit.
	£ s. d.	£ s. d.	£ s. d.
If under 150 tons	0 15 0	1 5 0	2 0 0
150 and under 200	0 17 6	1 10 0	2 7 0
200 „ 300	1 0 0	1 17 6	2 17 6
300 „ 400	1 5 0	2 5 0	3 5 0
400 „ 500	1 7 6	2 10 0	3 10 0
500 „ 600	1 10 0	2 15 0	4 0 0
600 „ 700	1 12 6	3 0 0	4 7 6
800 „ 900	2 0 0	3 15 0	5 10 0
1,000 „ 1,250	2 10 0	4 15 0	7 0 0
1,250 and upwards	3 0 0	5 15 0	8 10 0

FIRST LIMIT. Cardiff, Nash, or Kingroad, to any place west of Nash and east of Coombe.

SECOND LIMIT. Between Cardiff Roads and Coombe, or west of Nash and east of Coombe.

THIRD LIMIT. Between Cardiff Roads and Lundy Island or any point west of Coombe.

BALLAST. Discharging ballast with the Dock Company, for quantity delivered : vessels under 200 tons register, 5*d.* $\frac{7}{8}$ ton ; 400, 6*d.* ; 600, 7*d.* ; 800, 8*d.* ; 800 and upwards, 9*d.* In the West Bute Dock ballast is discharged by steam machinery at 40 tons $\frac{7}{8}$ hour at about the same cost.

Briton Ferry. Port of Neath.

Harbour Dues, 1½*d.* $\frac{7}{8}$ registered ton ; Corporation, 1*s.* 6*d.* $\frac{7}{8}$ vessel.

PILOTAGE. From outside Neath Bar to the Layer, and *vice versa* : 7 and under 7½ feet, 7*s.* ; 7½ and under 8, 8*s.* ; 8 and under 8½, 10*s.* ; 8½ and under 9, 11*s.* ; 9 and under 9½, 11*s.* 2*d.* ; 9½ and under 10, 11*s.* 6*d.* ; 10 and under 10½, 12*s.* ; 10½ and under 11, 12*s.* 6*d.* ; 11 and under 11½, 13*s.* ; 11½ and under 12, 14*s.* ; 12 and under 12½, 15*s.* ; 12½ and under 13, 16*s.* 6*d.* ; 13 and under 13½, 18*s.* ; 13½ and under 14, 20*s.* ; 14 and under 14½, 24*s.* ; 14½ and under 15, 27*s.* ; 15 feet and upwards, 37*s.*

BALLAST. Wheeling, 1*d.* $\frac{1}{2}$ ton ; for each man employed, 3*s.* 6*d.* a day, including allowance.

Discharging IRON ORE at Railway wharf by hydraulic cranes, working 50 tons $\frac{1}{2}$ hour, 6*d.* $\frac{1}{2}$ ton, including allowance.

Swansea.

The dock is 11 acres, average depth inside 22 $\frac{1}{2}$ feet; Dock Gates 23 feet average at Springs ; 11 to 14 at Neaps.

TONNAGE ON SHIPPING. To or from any port in the United Kingdom : under 100 tons, 4*d.* $\frac{1}{2}$ ton ; 150 and under 250, 5 $\frac{1}{2}$ *d.* ; 250 and under 350, 7*d.* ; 350 and upwards, 8 $\frac{1}{2}$ *d.*

To or from any port in Europe, or within the Straits of Gibraltar : under 100 tons, 4*d.* ; 100 and under 250, 6*d.* ; 250 and under 350, 7 $\frac{1}{2}$ *d.* ; 350 and upwards, 9*d.*

To or from any port or place : under 150 tons, 7 $\frac{1}{2}$ *d.* ; 150 and under 250, 9 $\frac{1}{2}$ *d.* ; 250 and under 350, 1*s.* ; 350 and upwards, 1*s.* 3*d.*

WHARFAGE, paid by ship, 1 $\frac{1}{2}$ *d.* $\frac{1}{2}$ ton.

Newport, Monmouthshire.

Dock 12 $\frac{1}{2}$ acres, depth uniformly 24 feet ; Dock Gates, average Springs 32 feet ; Neaps 21 feet. The Usk, which flows by the town is of great width, and the depth is equal to that of the Newport Dock Gates. There are numerous shipping wharves, where vessels from 400 to 500 tons burthen can be loaded with coal or iron with great despatch.

DOCK DUES. COASTING : 2*d.* $\frac{1}{2}$ ton measurement. FOREIGN : to or from every other part of Europe, except within the Straits, and round North Cape, 6*d.* $\frac{1}{2}$ ton measurement.

To or from any port or place in Europe round North Cape, or any port or place within the Straits, whether in Europe, Asia, or Africa, 7*d.* $\frac{1}{2}$ ton measurement.

To or from any port or place in British America, any port or place in the United States, or any other part of the world, 10*d.* $\frac{1}{2}$ ton measurement.

HARBOUR DUES. COASTWISE : $\frac{1}{4}$ *d.* $\frac{1}{2}$ ton measurement. FOREIGN : $\frac{1}{4}$ *d.*

PILOTAGE. Newport or Pillgwenlly to the mouth of the Usk, and *vice versa* :

Vessels $\frac{1}{2}$ foot.	Coast.		Foreign.	
	s.	d.	s.	d.
Under 9 feet	0	9	1	0
9 and under 12	1	0	1	3
12 „ 15	1	3	1	6
15 and upwards ...	1	6	2	0

Newport or Pillgwenlly to Penarth or Kingroad, and *vice versa* (provided no Bristol Pilot should offer outside the Newport District) :

	s.		s.	
	d.		d.	
Under 9 feet	1	6	1	9
9 and under 12	1	9	2	0
12 „ 15	2	0	2	6
15 and upwards	2	3	3	0

TOWAGE. Short distances in the Usk, 1*d.* $\frac{1}{2}$ ton reg. ; entire length of river from Docks to mouth, 2*d.* ; to the Deepwater Buoy, 2 $\frac{1}{2}$ *d.* ; to the Holmes, 3 $\frac{1}{2}$ *d.* Discharging and removing ballast, 6 $\frac{1}{2}$ *d.* $\frac{1}{2}$ ton.

River Tyne.

TOWAGE RATES within sea limits at sea, to Shields or either Dock.

LIGHT VESSEL.									LOADED VESSEL.										
Vessel.	Sea to Shields.			Sea to Dock.			Shields to Dock.			Vessel.	Sea to Shields.			Shields to Dock.			Sea to Dock.		
tons.	£	s.	d.	£	s.	d.	£	s.	d.	tons.	£	s.	d.	£	s.	d.	£	s.	d.
40	0	10	0	0	14	0	0	6	6	40	0	10	0	0	9	0	0	14	0
50	0	10	6	0	15	0	0	7	0	50	0	11	0	0	9	6	0	15	0
60	0	11	0	0	16	0	0	7	6	60	0	12	0	0	10	0	0	16	0
70	0	11	6	0	16	6	0	8	0	70	0	13	0	0	10	6	0	17	0
80	0	12	0	0	17	0	0	8	6	80	0	14	0	0	11	0	0	18	0
90	0	12	6	0	17	6	0	9	0	90	0	15	0	0	11	6	0	19	0
100	0	13	0	0	18	6	0	9	0	100	0	16	0	0	12	0	1	0	0
110	0	13	6	0	19	6	0	9	0	110	0	17	0	0	13	0	1	1	0
120	0	14	0	1	0	6	0	9	0	120	0	17	6	0	14	0	1	2	0
130	0	14	6	1	1	0	0	9	0	130	0	18	0	0	14	6	1	2	6
140	0	15	0	1	1	6	0	9	0	140	0	18	6	0	15	0	1	3	0
150	0	15	6	1	2	0	0	9	6	150	0	19	0	0	15	6	1	3	6

TOWAGE RATES above 150 tons register. LIGHT VESSEL : sea to Shields, 1½d. ̄ ton ; sea to Dock, 1½d. ; Shields to Dock 1½d. LOADED VESSEL : sea to Shields, 1½d. ; Shields to Dock, 1½d. ; sea to Dock ¾d.

SHIFTING. Vessels over 150 tons, loaded, ¾d. ̄ ton ; light, ¾d. ̄ ton below 150 tons.

Under 50 tons, per shift, loaded 5s. ; light 4s.

100 " " " 6s. ; " 5s.

150 " " " 7s. ; " 6s.

	d.	d.
Shields to either Dock, Jarrow, or Willington, 1st station	1½	or 0½
Wallsend or Gosforth	2nd	" 1½
Walker or Pelaw Main	3rd	" 1½
Bill Quay or Felling	4th	" 1½
Dout's Hole or Tyne Main	5th	" 2
Newcastle	6th	" 2½

Extra rate to be added to all Tyne Towage rates : namely, two pence in the shilling to be added to all rates after October, 1872.

173. COCCULUS INDICUS, Indian Berry or Levant Nut ; it is kidney-shaped, and possesses an inebriating quality ; Bombay ton 16 cwt. in bags.

174. COCHINEAL is the dried carcase of the female Coccus cacti, an insect which feeds on several species of *Opuntia* : they produce a brilliant crimson dye ; 70,000 are required to weigh one pound. They are divided into two classes, viz. : those which have bred, and those which have arrived at maturity but have not commenced breeding. The former are black and produce the best dye, they being

apparently all skin ; in the skin the finest dye is said to exist ; they are consequently rather more valuable ; being hollow they are commercially termed "shelly cochineal." By the Spaniards they are called "madres," *i.e.* mothers. In Honduras the blacks are called "cascarilla," the silvers "grana." Those which have not commenced breeding are white and solid, and are called "silver cochineal ;" they are most esteemed when large in size and bright in colour. There is a class called "granilla," which is the insect before it has arrived at full size. The blacks after breeding and the silvers when gathered, are suffocated and cured in ovens. The **harvest** is principally between April and August ; shipments take place all the year round, the most of course just after the harvest ; the principal portion of the English supply arrives therefore between May and September. Cochineal was found originally by HERNANDO CORTEZ, in Mexico, whence it was introduced to Honduras, which for many years, up to 1864, has produced the largest supply. In consequence of disease in the vine, which diminished its cultivation, cochineal was introduced to the Canary Islands, where the yield will probably in time exceed that of Honduras ; this is generally known as Teneriffe cochineal. Peru produces a very small quantity usually called Lima cochineal. An inferior quality is obtained in the Dutch settlement of Java, which is sent to Holland. The crop from Honduras averages 10,000 bags or serons, from Mexico 1,500 to 2,000, and from the Canaries 7,000 or 8,000. The chief places for export are Belize in Honduras, Vera Cruz in Mexico, and Santa Cruz, Teneriffe. Mexican and Honduras cochineal is generally brought to England by the West India Mail steamers. Sometimes one or two shipments of 1,000 to 2,000 bags from Central America, will during the season, come round Cape Horn, and arrive in England in December or January. Teneriffe cochineal is brought by the West Coast of Africa Mail Steamers, North African steamers, and by Canary traders.

175. The average weight of packages from Central America, whence it is brought in canvas bags cased in untanned hides, is each, with its contents, about $1\frac{1}{2}$ cwt., and is called a seron ; a gain or loss of one or two pounds may occur during the voyage. From the Canaries it comes in canvas bags, cased in rush matting. The tare is generally 1 to 2 lbs. for an inside bag, and 7 lbs. and upwards for the hide or mat outside, according to its weight. A bag of cochineal from Mexico weighs 200 lbs. ; Honduras, 168 lbs. ($1\frac{1}{2}$ cwt) ; and Teneriffe, 150 lbs. Cochineal in bulk weighs less than wheat. It is re-exported in canvas bags packed in casks, bales and boxes. Bombay and Madras ton for freight 50 cubic feet.

176. Cochineal should not be stowed near the engine-room or boiler of a steam-ship, or in any hot place, as it is liable to "sweat" or become clammy. Sweating is however frequently due to its having been badly cured or dried. It should not be placed contiguous to oils or liquids, the melting or leakage of which will injure it; so will the moisture from nitrate of soda, sugar, tobacco, &c. Cochineal will draw leakage from casks stowed near.

177. Fifty-one serons of **cochineal** packed in the usual West Coast hides, each seron weighing about 120 lbs. gross were shipped at Callao in 1861, on board one of the Pacific Steam Navigation Co's. steamers, for the isthmus of Panama, across which they were conveyed by rail to Colon, and there shipped on board the *Plantagenet*, one of the Liverpool and West India Co's. steamers, for Liverpool. When landed, three experienced produce brokers declared the parcel damaged owing "to improper stowage, the cochineal having been placed upon vegetable nuts and copper." A claim of about £280 was made on the owners of the *Plantagenet*, who resisted it successfully on the strength of a clause in their bills of lading to the effect that they do not hold themselves liable for "any act, neglect, or default whatsoever, of the pilot, master, or mariners." This clause was considered very unusual, and has since been expunged. The improper stowage occurred at Colon, as that was the only port on the route where vegetable nuts were shipped on that voyage.

178. COCOA, the seeds or kernels of the cocoa or chocolate plant *Theobroma Cacao*, which grows in South America and other tropical climates; the plant is altogether different from the cocoa-nut tree; it bears leaves, flowers, and fruit all the year round; but the usual **seasons** for gathering the fruit are June and December; in bags, dunnaged 9 inches, bilge 14, sides 2½. Large quantities are shipped at Guyaquil; in 1860, the brig *Belle of Devon* took in there 4,765 quintals of 106 lbs. English each, equal to 225½ tons. The cocoa was in bags of 160 lb., with liberty to start a portion for stowage; 300 bags were started. The brig took for ballast 20 tons of silver ore, in 400 bags of 1 cwt. each; so laden she was very lively at sea. Cocoa must be kept perfectly dry. It is classed at LLOYD'S as corn, flour, &c. The *Belle* registers 198 tons; builder's measurement 276 tons; has carried 310 tons of coal, dead-weight; and, including 40 tons of coal for ballast, 16,900 cubic feet measurement goods; in other words, she carries 422½ tons measurement goods—40 feet to the ton. Bombay ton cocoa 12 cwt. New York 1,120 lbs. casks, 1,307 bags, 16 cwt. bulk. Baltimore 1,300 lbs. bags or bulk, or 1,120 lbs. casks. Bahia 56 arrobas, bags,=16 cwt. or 800 French kilos. Taking sugar

at 70s. \pounds ton freight, the freight of cocoa should be 80s. and of rum 4s. 08d. \pounds gallon. A bag of cocoa weighs usually about 1 cwt., a cask 1 $\frac{1}{2}$ cwt. **Tare:** at Hamburg the tare is, Carraccas in serons 12 lbs.; Guyaquil bags 2 to 3 lbs.; Trinidad bags 3lbs.; Maranham and Para, casks real. Cocoa husks and shells, the refuse of the chocolate factories, is brought from Gibraltar and other places as well as from the West Indies.

179. COCOA OILS; see oils.

180. COFFEE. The plant is a native of Yemen in Arabia, but it is now cultivated very extensively in the southern extremity of India, in Java, the West Indies, Brazil, Ceylon, South Africa, &c. The berries are generally of an oval form, smaller than horse beans. In the East Indies it is shipped all the year round, chiefly from October to May; the new crop comes in in October. Very little is grown in Bengal, Manilla, or Madras, whence it is shipped during the north-east monsoons, in cases containing 200 lbs. each, of which ten go to a ton for freight. The gathering of the crop in Ceylon commences usually in October, and by the end of December all will be off the trees. It is packed chiefly in casks containing 8 cwt. each, of which two go to a ton for freight. All the crop grown by the natives (a very small quantity), is exported in bags. Coffee in bags requires to be dunnaged in the bottom 9 inches, bilge 14, and sides 2 $\frac{1}{2}$; it should always be shipped in double bags, when single they will not bear handling; the dunnage ought to be well covered, so as to save the coffee, in case the lower tier of bags are bursted by the pressure from above. When receiving coffee in casks or bags, masters should be sure they are in good condition, before signing receipts or bills of lading, or the ship will suffer on discharging. The berries readily imbibe exhalations from other bodies, guano especially, and thereby acquire an adventitious and disagreeable flavour; sugar placed near will, in a short time, so impregnate the berries and injure their flavour as to lower their value 10 to 20 \pounds cent.; rum has nearly the same effect. Dr. MOSELEY mentions that a few bags of pepper on board a ship from India spoiled a whole cargo of coffee. It should never be stowed near salt—the evaporation from which is highly detrimental. Coffee usually gains weight on the passage home, if shipped perfectly dry. Unless well ventilated it will “steam;” some masters keep the fore and after hatchways open in fine weather; the tightest and best ships are most likely to “steam” their cargoes. In a green state coffee is very liable to ferment; see chicory.

181. At **La Guayra**, mats for lining the bottom and sides of vessels loading coffee, cost per dozen from two to three dollars. There

are two sorts of coffee shipped at Colombo, viz. : native and plantation. Native weighs 14 to 15 cwt. to the measurement ton, and plantation 18 to 19 cwt. In chartering masters ought to specify which sort they intend to ship, as native coffee should have a higher rate than plantation.

182. Coffee is sometimes shipped at Rio Janeiro in the same hold with hides, which are occasionally used for dunnage ; the coffee often gets heated, and if the evil is increased by deck leaks and putridity among the hides, the whole cargo will be damaged. In the West Indies it is shipped all the year round, but less during the hurricane months—from the beginning of August to the month of January. Coffee alone is dunnaged there with 8 or 10 inches of logwood, carefully covered with mats or old sails ; in bags it should have staves or matting all up the sides. In the Common Pleas, 26th June, 1866, PALMER sued LEMON for damage done to bags of coffee, shipped at Manilla, in the *Sepoy*. It was alleged that the coffee was strongly impregnated with the smell of rank Manilla oil which was stowed in the bottom of the hold—verdict for plaintiff. At Ceylon, when cocoa-nut oil is stowed in the bottom, and loose coir yarn is used for dunnage, to receive coffee, the yarn should be previously well covered with mats ; the yarn should not come in contact with the oil.

TON FOR FREIGHT IN CEYLON.

Coffee in casks 16 cwt.
Do. in bags 18 cwt.
Cocoa-nut oil 210 imperial gallons.
Cinnamon 800 lbs.
Cardamoms 12 cwt.

Pepper 16 cwt. robbins, 18 cwt. bags.
Coir-rope, yarn, and junk 12 cwt.
Horns 16 cwt.
Plumbago and ebony 20 cwt.
Cotton 5 bales to the ton.

AT MADRAS.

Rice, sugar, saltpetre, wood, and other heavy goods are 20 cwt. ; of seeds and hides 18 cwt. ; of cotton 5 bales ; of indigo and piece goods 50 cubic feet.

Proportionate Tonnage. 40 tierces of coffee of 7 cwt. each, weighing 14 tons, or 230 bags $1\frac{1}{2}$ cwt. each ($17\frac{1}{2}$ tons) will occupy 850 cubic feet or 1 keel.

Tonnage for Freight. Bengal and Madras bags 18 cwt., robbins and casks 16 cwt. ; Madras in cases 17 cwt. ; Bombay bags or frazils 16 cwt., cases 50 cubic feet. At Ceylon 18 cwt. in bags or 16 cwt. in casks. Manilla coffee is often freighted by the pecul, which weighs 132 lbs. At New York 1,568 lbs. in casks, 1,830 lbs. in bags, or 16 cwt. in bulk. At Baltimore 1,830 lbs. in bags, 1,600 lbs. in casks. At Bahia 63 arrobas (18 cwt.) in barrels, or $73\frac{1}{2}$ arrobas (21 cwt.) in bags. When wheat is freighted at 1s. $\frac{3}{4}$ quarter, coffee in tierces is rated at 6s. $11\frac{1}{2}$ d. $\frac{3}{4}$ ton, in bags 5s. $7\frac{1}{2}$ d.

Packages. Barrel 1 to $1\frac{1}{2}$ cwt., a bag $1\frac{1}{2}$ to $1\frac{1}{2}$ cwt., and a tierce 5 to 7 cwt. Coffee is sold at Lisbon by the arroba 22 lbs. 100 lbs. Portuguese=101·19 avoirdupois. A Mocha robbin 1 to $1\frac{1}{2}$ cwt., a Mocha bale 2 to $2\frac{1}{2}$ cwt. A bag at Havana 150 lbs. ; an arroba 25 lbs. ; a quintal 100 lbs. ; 100 lbs. Spanish, $101\frac{1}{2}$ lbs. English.

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A bocoy at Cuba, grande 40 arrobas, pequena 28 arrobas. A Brazilian arroba usually renders $29\frac{1}{4}$ lbs. Hamburg, and Havana 23 to $23\frac{1}{4}$ lbs. 105 lbs. Hamburg = 112 lbs. English. A parah at Ceylon 35 to 50 lbs.

Hamburg Tares. All casks the real tare; bags of Havana 4 lbs. up to 180 lbs., 5 lbs. beyond; Mocha 4 lbs. $\frac{3}{4}$ bale; Cuba, Porto Rico, La Guayra, St. Domingo, Brazil, Cheribon and Java, and Triage—bags 3 lbs. up to 180 lbs., 4 lbs. beyond.

183. COIR, a kind of yarn manufactured from the fibrous husk of cocoa-nuts; see rope. Bombay ton coir rope 10 cwt. or 50 cubic feet.

184. COKE; see coal and charter-party.

185. COKER OR COKER NUTS, a woody fruit covered with a fibrous husk, growing on a species of palm in most hot climates; they are shipped in the West Indies all the year round, as there are green nuts and ripe nuts on the same trees almost continuously; they are generally used as dunnage, which should be stated on the bill of lading.

186. COLOCYNTH (bitter cucumber or gourd), about the size and shape of a large orange, with a thin leathery yellowish rind; Bombay ton 50 cubic feet, in bags.

187. COLOMBO ROOT (Calumba), the root of the *Cocculus palmatus*; it is imported from Ceylon in circular brown knobs, wrinkled on the outer surface, and yellowish within: it is medicinal. Bombay ton 14 cwt., in bags.

188. COMBUSTION (SPONTANEOUS). It is too commonly supposed that cases of fire are almost always traceable to the intentional or accidental access of fire to inflammable substances. The accompanying list of substances liable to spontaneous combustion, without any application of heat, will show that greater danger is to be apprehended from these bodies than from the taking fire of ordinary inflammable substances.

189. Little more is necessary for the prevention of fire on board ship, or for the control and extinction of it, when it has broken out, than a careful and judicious application of the few simple principles involved in the theory of combustion.

190. Two distinct classes of bodies are necessary for the production of fire, viz.: combustibles and supporters of combustion. Atmospheric air is the most common supporter of combustion. When wood burns, its constituents, carbon and hydrogen, combine with the oxygen of the air, and produce water and carbonic acid, both of which substances are destroyers of combustion.

191. Bearing these facts in mind, they should be thus applied. A fire has broken out in the hold of a ship, in a part quite inaccessible. Fire cannot continue without a constant supply of air, therefore use the utmost diligence in stopping every hole and crevice through which air can obtain access to the combustible; and prevent as much as possible the passing off of the smoke produced, because it contains carbonic acid, which is even a more active extinguisher of fire than water itself. On board steam-ships, a pipe accessible from the deck, should if possible, be laid on from the boiler, to communicate with every part, and furnished with cocks or valves, by which the steam could be directed wherever it was required. In case of fire, the locality should be closed as completely as possible, and a supply of steam turned on, to expel the atmosphere quickly. As the air is as absolutely necessary for combustion as the combustible, its removal will be as efficient for the extinction of fire as would be that of the combustible itself.

192. Some bodies, such as gunpowder, nitre, and saltpetre, contain within themselves the elements of combustion, they should therefore be stowed apart from other combustible bodies, and arrangements made for quickly drowning them with water, through a pipe leading directly from the deck. With such ready means of preventing danger from explosion, the confidence of the crew may be maintained, and the necessary efforts continued for the extinction of the fire.

193. For the development of spontaneous combustion in any of the bodies in the annexed list, heat, moisture, and atmospheric air must be present together. If oil and cotton get together, and atmospheric air have access, spontaneous combustion will not commence until moisture be present, and a certain temperature, say 60° , be attained. If more water have access, any inclination to increase of temperature will be neutralized by the water dispersing the heat through surrounding bodies. If excess of water be not present, the temperature will go on increasing, provided the atmosphere be stagnant; but if there be room for rapid ventilation, the increase will be prevented by the heat being carried off in the vapour produced, but removed by the stream of air; see coal, fermentation, fire, hay, naptha, oil, vapour damage, ventilation, wool, &c.

194. A list of substances liable to **spontaneous combustion** either by the absorption of moisture, by decomposition, or by the evolution of gas.

By the absorption of moisture: Barilla, black ash waste, bones, bone dust, charcoal wood, charcoal peat, chocolate, chicory roasted, coffee roasted, corn, cot-

ton cloth, cotton raw, cotton waste, fibrous vegetable and animal substances of every description, flax, flour, guano, hay, hemp, lamp black, lime, oakum, oatmeal, old rags with oil and moisture or without oil, paper, peat, rope, sawdust, woollen cloths.

By decomposition : Brassy coal or coal brasses, or iron pyrites in coal used for making copperas, copper pyrites or sulphurous copper ore ; cloth, woollen, or cotton, with moisture or with oils and moisture ; fireworks, iron pyrites, iron recently raised from long-continued submersion in salt water, linseed meal, lucifer matches by friction or concussion (fires have been occasioned by rats gnawing wax vestas or lucifers), oil cake ; oils, vegetable or animal ; and fats with any vegetable fibre, moisture, and slight heat are sure to take fire ; oil cloth, paints, printing ink ; pictures, *i.e.* oil paintings ; wipings, *i.e.* cotton waste which is commonly employed for the purpose of cleaning machinery ; or any other cotton, flax, hemp, or woollen waste cloth or fibre that may have been used for wiping off the oil and dirt from machinery, is peculiarly dangerous ; wood, sawdust, and other combustible bodies are commonly supposed to require flame for ignition, or at least a very high temperature, but a close atmosphere, with a temperature of less than 180° Fah. long continued, is sufficient to cause spontaneous combustion ; waterproof clothing. Or,

By the evolution of Gas : Coal bituminous, some sorts are peculiarly liable to evolve a combustible gas which does not take fire spontaneously, but which having access to a lighted candle or fire, will ignite, and explode with sufficient violence to blow up the decks. Guano, taking moisture, will evolve gas in sufficient quantity to risk an explosion. Vapour of spirits, such as brandy, rum, whiskey, pyroxilic spirit, naphtha, turpentine, &c., like gas, is liable to take fire at a considerable distance from a broken or opened vessel containing them, and consequently of course to set fire to surrounding bodies.

195. COMMISSIONS AT LISBON. The following are the usual regular charges :—

On gross sales	2½ % cent.	Shipments	2½ % cent.
Disbursements	2½ % cent.	Remitting	½ "
Brokerage factorage on bills			½ "
Interest factorage on advances	% month		½ "
Corn factorage on flour	% barrel	100 reis.	
" " grain	% moio	400 "	

COMMISSIONS ON VESSELS.

On money disbursed, where bills are drawn	5 % cent.
On sales where sufficient part of cargo is sold to pay disbursements, either on owner's or underwriter's account	5 "
On estimated value of the whole or whatever part of the cargo is landed and re-shipped	1½ "

COMMISSIONS ON SHIPPING, &c. AT SYDNEY.

Private or public sales of merchandize, 5 % cent.	Sales or purchases of live stock or stations 2½ per cent.
Sales or purchases of ships, houses, and lands, 2½ % cent.	Sales of wool and tallow (inclusive of auctioneer's commission) 2½ % cent.
Sales or purchases of Government securities, and shares in public companies, (one commission only) 1 % cent.	Sales of hides and sheepskins (exclusive of auctioneer's commission), 2½ % cent.

Sales or purchases of gold, gold-dust bullion, and specie, $\frac{1}{2}$ % cent.

Procuring freight and passengers for vessels, 5 % cent.

Collecting inward freight or charter money, or money under bottomry, 5 % cent.

Endeavouring to obtain emigrant ship's papers, irrespective of any other claim for claim for extra service, 20 guineas.

Ship's disbursements arising from freights collected, *nil*.

Ship's disbursements from funds in hand not arising from freight collected, $2\frac{1}{2}$ % cent.

Ship's disbursements when not in funds 5 % cent.

All property withdrawn, shipped or delivered to order, one half the rates chargeable in case of sale.

Goods for conditional delivery, $2\frac{1}{2}$ % cent.

Purchases of merchandize with funds, $2\frac{1}{2}$ per cent.

Purchases of merchandize without funds, 5 % cent.

Advances on produce for shipment, 1 % cent.

Receiving merchandize (exclusive of gold, bullion, and specie), for shipment and forwarding, actual charges and $\frac{1}{2}$ % cent.

Auctioneer's commission and brokerage to be charged when incurred.

Effecting insurance, 5 % cent. on premium.

Settling insurance losses, total or partial, and procuring returns of premium, $2\frac{1}{2}$ % cent.

Procuring money on bottomry and respondentia, $2\frac{1}{2}$ % cent.

Guaranteeing sales, bills, or bonds, by endorsement or otherwise (for periods not exceeding six months' currency), $2\frac{1}{2}$ % cent.

Recovering debts, 5 % cent.

The management of estates, 5 % cent.

Procuring charter for vessels, including collecting of freight if the ship returns, 5 % cent.

Investments made on mortgage, $2\frac{1}{2}$ % cent.

Receiving mortgage money on which a commission has been previously obtained on investment, including remittance by bill of exchange, 1 % cent.

Receiving money under mortgage on which no commission has been previously obtained, including remittance by bill of exchange, $2\frac{1}{2}$ % cent.

Acting as trustee on assignments, 5 % cent.

Settler's Account.

Purchase of payments under advance 5 % cent.

Ditto, ditto with funds, $2\frac{1}{2}$ % cent.

Any balance of account unliquidated at the end of a year, to be considered a new advance, and charged accordingly, 5 % cent.

Interest on current accounts to be charged at bank rates on cash credits, or overdrawn accounts.

Re-exchange.

Intercolonial bills dishonoured, 5 % cent. and notarial charges.

Bills from New Zealand dishonoured, $7\frac{1}{2}$ % cent. and notarial charges.

English and foreign bills dishonoured, 20 % cent. and notarial charges.

COMMISSION ON SHIPS AT PORT ADELAIDE, SOUTH AUSTRALIA.

On selling ships, $2\frac{1}{2}$ % cent.

Purchasing do. when in funds $2\frac{1}{2}$ % cent.

Ditto, when not in funds, 5 % cent.

Effecting charter, procuring freight and passengers, 5 % cent.

Outfits and disbursements, when in funds, $2\frac{1}{2}$ % cent.

Ditto, when not in funds, 5 % cent.

Collecting charter money or freight, 5 % cent.

COMMISSION ON SHIPS AT PORT ADELAIDE—continued.

Procuring advances or collecting money
on bottomry or respondentia, $2\frac{1}{2}\%$ ct.

Passing accounts at government offices
for emigrant ships, ten guineas.

Checking expenditure accounts on
behalf of charterers for passenger
vessels, granting certificates and

receiving surplus store, if any, ten
guineas.

Surveys.

For surveys on damaged goods, each
surveyor one guinea.

For surveying hatches, ditto one guinea.

For marine surveys, ditto two guineas.

TABLE OF FEES PAYABLE TO BRITISH CONSULS.

	£	s.	d.
Certificate of due landing of goods exported from the United Kingdom	0	9	0
Signature of ship's manifest	0	5	0
Bill of health	0	10	0
Signature of muster roll	0	5	0
Attestation of a signature.....	0	2	0
Administering an oath	0	2	0
Seal of office and signature of any other document not specified herein, when required	0	5	0
Attesting bottomry or arbitration bond not prepared by consul	0	5	0
Noting a protest.....	0	5	0
Order of survey	0	5	0
Extending a protest or survey, with certified copy if required	1	0	0
Registrations	0	2	6
Vise of passport	0	2	0
Attending valuation of goods, if under £200 in value.....	0	10	6
Attending sales, where the purchase money is under £200	1	1	0
„ „ for every day during which the sale continues.....	2	2	0
Attendance out of consular office at a shipwreck, for his personal expenses, over and above his travelling ex- penses	1	1	0
Opening of will of a British subject (not being a seaman)	1	1	0
Management of property of British subjects (not being seamen) dying intestate.....	$2\frac{1}{2}\%$		cent.

NOTE. The above fees, if not paid in British money, are to be calculated at the current rate of exchange.

196. **COOLIES** are shipped from Calcutta and Madras, and also from the French port of Pondicherry, and are carried to the Mauritius, Reunion, Natal, and the West Indies. Those for the West Indies are shipped during December and January, and for the other ports all the year round. They are also shipped from Swatow and Macao. The freight is usually paid at per adult on those landed alive, half freight payable in advance; ship to find provisions and fittings, and

not to carry more than one adult for every two register tons. The master should inspect them before shipment, and only accept healthy ones : he generally receives a small gratuity per head for those landed alive and not blind.

197. COPPER, pure, is made up at **Swansea** in ingots of 14 lbs, and cakes 20 to 50 lbs. Schooners of 80 tons register and 130 burthen, with a hold 11 feet 3 inches deep, and drawing 11 feet, are provided with three keelsons, five feet high, to support a platform on which the copper is stowed, amidships, as high as possible, to prevent the vessel from labouring ; in winter, sharp vessels require the copper to be laid right across, and to avoid shifting, spare rope, warps, mooring chains, &c., are placed over all ; sheathing copper is made up in cases containing 5 to 10 cwt. each ; dunnage on the ceiling, as salt water injures its appearance ; see metals. Copper and copper ore are also sent from Adelaide to Melbourne by steamers, to be shipped at a low rate of freight as ballast, in the large passenger ships which carry almost entirely wool during the season, with passengers in the 'tween decks. The copper is in ingots and cakes, the latter weighing about 50 lbs., and the ore in bags of 1½ to 2 cwt. A cubic foot of melted copper weighs 545 lbs. ; native metal 600 lbs. ; and copper medals 620 lbs. Specific gravity 8·584 to 8·900.

198. Bar Copper and Block Tin are shipped on the West Coast of **South America**, in naked rough bars, varying in weight from 150 to 250 lbs., and in lots from 60 to 90 tons. Being very much heavier than ores, and of course more straining to a ship, it generally pays 15s. per ton English beyond the freight for ores. A considerable quantity of grain copper, called "barilla," packed in small canvas bags, is shipped at Africa for England ; it is brought from the washings beyond Tacua on llamas—a kind of diminutive camel—and from Tacua to Arica by railway. Like all dead-weight, bar copper and block tin are kept as high as possible. In a ship of 420 tons register, an experienced master has always stowed them in the 'tween decks, right fore and aft from bulkhead to bulkhead, in tiers of six blocks abreast, occupying about 5 feet only in width. Deals fixed on their edges each side of the ship, right fore and aft, form a sort of baby trunk which is safely fastened to the 'tween deck stanchions. This plan not only relieves the wings, but secures the full support of the centre stanchions in the lower hold. At **Adelaide**, copper ingots weigh about 15 or 16 lbs. each, and measure 9×3×3 inches. They contain 95 per cent. of pure metal, and are shipped all the year round, principally to India. 21 cwt. of copper is sometimes taken as a ton ; E.I.Co. allows 20 cwt. of Japan copper to the ton ; at Baltimore

2,240 lbs. ; at Valparaiso a quintal is 100 lbs. When wheat is 1s. 4^p quarter freight, copper is rated at 4s. 9d. 4^p ton of 20 cwt.

199. COAST OF CHILE. The **port dues** in all ports of entry are the same. Hospital dues, 10 c. per ton register, to be paid once a year ; anchorage, \$2 ; articles, \$2 to be paid each time of entry ; pilotage, when such are appointed, 100 tons register, \$6 ; to 200 tons, \$8 ; to 400 tons, \$10 ; 600 tons, \$12 ; to 1,000 tons, \$14 ; above 1,000 tons, \$16 ; last three items are also payable in the minor ports. Light dues, foreign, 3d. ; coastwise, 2d. 4^p ton, not payable by vessels in distress, ballast, whaling, or those that discharge no more than 20 packages.

200. COPPER SULPHATE, or blue vitriol, is soluble in water and poisonous, and should therefore be kept separate from every alimentary substance or other body subject to injury from stain ; it is also corrosive of iron, steel and zinc goods. It is packed in casks.

201. COPPERAS, a popular name for the beautiful green crystals forming sulphate of iron ; also called *green vitriol*. 20 hogsheads weighing 17 tons, will occupy 850 cubic feet or 1 keel. When wheat is 1s. 4^p quarter freight, copperas is rated at 4s. 10½d. 4^p hogshead. A hogshead weighs from 16 to 20 cwt.

202. COPPERAS, white ; see zinc sulphate.

203. COPRA. An Eastern name for the dried pulpy oil of the cocoa-nut ; it is the meat, flesh, or kernel of the cocoa-nut and is used extensively in France. When wetted with sea-water it ferments and may damage other goods, especially oil in casks ; see oil. Bombay ton 12 cwt.

204. COQUE DE PERLE. Bombay ton 20 cwt. in bags.

205. COQUILHOS. The coquilla nut is the fruit of the *Attalea funifera*, a South American palm. At Bahia the ton is 8 mil.

206. CORAL, a beautiful branched substance formed at the bottom of the sea by small animals called polypi ; there are three sorts red, white, and black. It is found in the Red Sea and in many parts of the Mediterranean, particularly about Marseilles, Tunis, and Sardinia. Coral is shipped all the year round. Bengal and Bombay ton 20 cwt. rough in bags, not specimens.

207. CORIANDER, the popular name of the genus of plants of one species, *Coriandrum sativum*, the seeds of which, when ripe and dry, have a strong aromatic odour and taste. They are very light

and are packed in bags, and are usually stowed in the 'tween decks or some other dry part of the ship. Madras ton 12 cwt. An essential oil is expressed from the seeds.

208. CORK. Specific gravity 0.240. In Spain and Portugal the bark is removed in July and August. In engaging it is usual to calculate 120 tons register to every 30 tons of cork; this calculation is for ships of ordinary construction; sharp vessels one-sixth or one-eighth less. Ships require full two-thirds of their ordinary ballast when loading cork; the heavier the ballast the larger the freight. At some ports, St. Ubes especially, salt can be obtained to answer the purpose of ballast; occasionally sulphur ore is taken, but a plentiful supply of matting should intervene, and the roughest cork placed next the ore. The same rule applies to sand, but consignees strongly object to its use, because it is driven into the cork by the motion of the ship at sea. No. 1 and No. 3 cork must be kept dry, as water discolours it and spoils the sale. Instances are reported where the decks have been blown up when a cargo has been completely saturated with water. Cork on deck should have a water course under, and tarpaulins or sails over. Cork is not packed so closely at Lisbon as at Faro; the packages there vary in weight from 130 to 170 lbs. each. In January, 1862, the barque *Emily*, of Newcastle, Capt. CROWLE, filled her hold with 65 tons of Lisbon cork; she was what is termed "blown up" with this cargo. Her ballast, 63 tons of sand, was levelled right fore and aft, as far as the runs at each end; it nearly covered the keelson; so laden she was rather light at sea. The *Emily* registers 251 tons, takes 22 keels of coal, and on one occasion had 420 tons of coal, 40 casks of linseed, and 4 large casks of lamp-black; she traded originally from Bristol to the West Indies, and is a full-carrying ship. The schooner *Ark*, of Dartmouth, Capt. ADAMS, 124 tons register, in May, 1854, took in 100 tons of lead at Seville, and 31 tons 9 cwt. of cork at Sines. The lead was placed on the floor, and the cork, 25 tons 15 cwt. over; it completely filled the hold; 5 tons 14 cwt. were carried on deck at half-freight. Full freight £3 15s.; lead 12s. The *Ark* is a lengthened ship and full built; with so much weight below she was very laboursome at sea; and drew aft 10½ feet, forward 9½ feet; with 200 tons of coal she drew 12½ and 11½ feet; length 86 feet, breadth 22 feet, depth 12 feet.

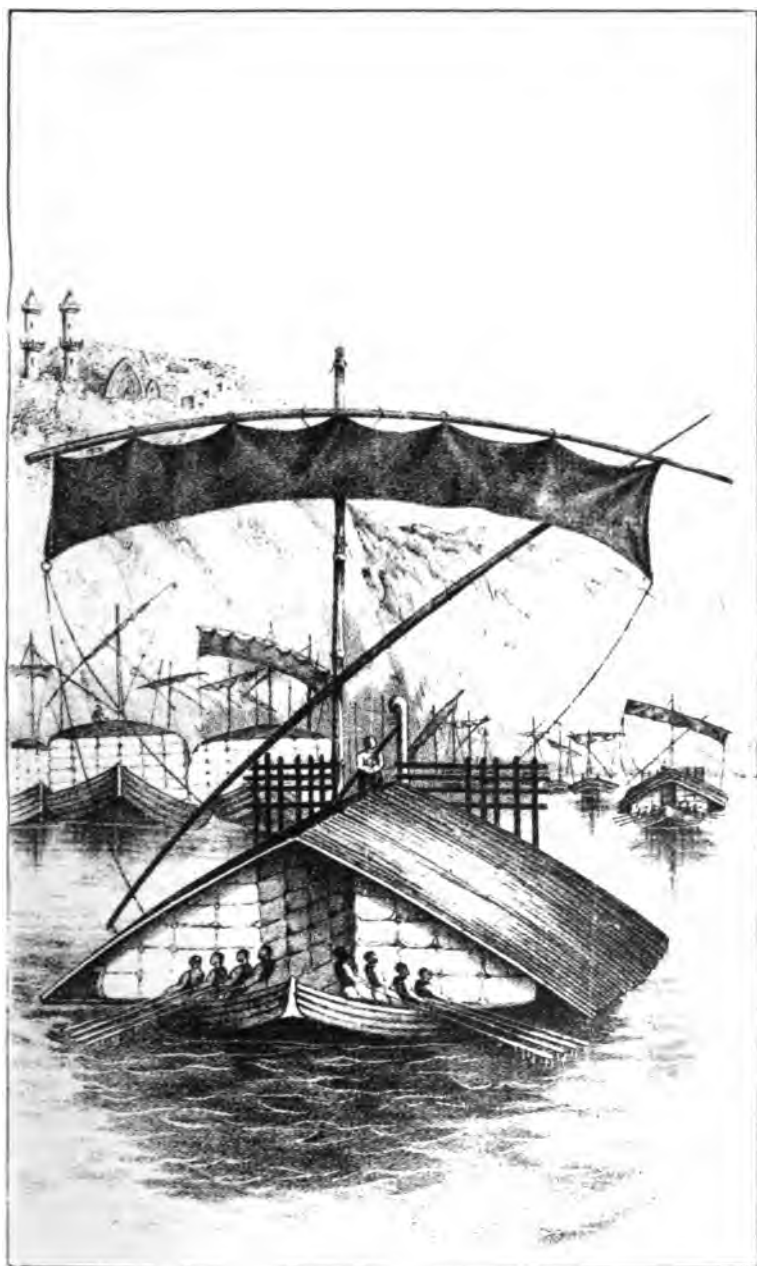
209. The following is the form of **charter-party** used by an eminent London firm:—"It is this day," &c., "after the discharge of her outward cargo at Seville, there receive on board lead for ballast, and proceed to Sines or so near thereunto as she may safely get, and

there load from the factors of the said merchant, a full and complete cargo of cork in bundles, or other lawful merchandize, with deck-load of cork, and as much loose cork as may be sufficient for broken stowage, not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions, and furniture. The ship to pay five shillings per bundle for every bundle cut open on board. The deck-load to be dunnaged, well secured, and covered with tarpaulins or sails. The ship must not be ballasted with mud or sand, or anything prejudicial to cork. No lead or other ballast to be stowed among the cork (except on planks), or in any so as to cause the bundles to be broken—a gangway to be left on each side of the deck-load, and screw ring-bolts to be provided for fastening the same. The cargo to be brought and taken from alongside the ship at the merchant's risk and expense, and to be stowed by charterer's agents at ship's expense; and the said ship being so loaded, shall therewith proceed to.....or so near unto as she may safely get; and deliver the same at such usual wharf or dock as the charterers or their agents may appoint, on being paid freight at and after the rate of £..... $\frac{1}{2}$ ton of 20 cwt. net delivered for all cork brought under deck in bundles, and half that rate for all cork brought upon deck, and for loose in the hold for broken stowage only." When making a purchase of cork on his own account, a master should be very cautious.

Tonnage. $\frac{1}{2}$ ton Faro cork will occupy a space of 850 cubic feet or 1 keel of 21 tons 4 cwt. When wheat is freighted at 1s. $\frac{1}{2}$ quarter, cork is rated at 21s. 6 $\frac{1}{2}$ d. $\frac{1}{2}$ ton, others say 20s. for cork wood. If already manufactured and in bales it pays, according to quality, 10 to 20 $\frac{1}{2}$ cent. more. When cork is freighted at £3 12s. 6d. $\frac{1}{2}$ ton, sulphur ore should be 15s.

210. COTTON, from the interior of India, is conveyed on solid wooden-wheeled carts, pad bullocks, and camels, through the ghauts or mountain passes, to Mizzapore on the banks of the Ganges, where it is shipped in very large **flat-bottomed boats**, provided with outrigger beams attached to the sides, to receive the shapeless and unwieldy bales. The current being swift, the usual masts are struck, a slender pole only being raised to hoist a small rugged sail, just sufficient to secure steerage way. There is an average of ten men to each boat. In this mode it is conveyed to Calcutta. Cotton is shipped all the year round from the **East Indies**, especially from Bombay; other parts on the Malabar Coast and Tuticorin, during the north-east monsoon, November to April. It is impossible to lay down any arbitrary rule for determining the quantity of *ballast* required with cotton. Under the heading Bombay, the quantity

STEVENS ON STOWAGE.



COTTON DOWN THE GANGES TO CALCUTTA.

taken by several ships is stated. Serious mistakes have been made by masters, through acting upon some imaginary belief as to the stability of their ships, not only by taking an insufficiency of ballast for their ordinary capacity, but by filling an immense poop with freight. The construction of the ship, her stability when light, the amount of the compression, and the nature or the specific gravity of the other parts of the cargo (if any) have to be considered. When the ballast is laid the height should be carefully measured from its level to the beams, to determine the number of edge and flat bales of cotton that can be stowed without losing space. The **dunnage** should be at least 9 inches on the floor and to the upper part of the bilge; the wing bales of the second tier kept 6 inches off the side at the lower corner, and $2\frac{1}{4}$ inches at the sides; sharp-bottomed ships one-third less dunnage in floor and bilges; for large ships 12 inches in the bilges and 9 inches on the floor is customary. Great attention is required to see that as much as possible is put into the hold; but occasionally time is lost in screwing hard to gain a little space; it frequently results in breaking posts and starting beams or stanchions, and it has been known to rend a ship at sea; much of the advice given in relation to stowing wool will apply here. If possible ballast should never be used for broken stowage except in the wings of the ground tier. When stone ballast is placed among the bales for broken stowage, it is necessary to ascertain that it is not of a quality likely to produce spontaneous combustion by its contiguity to the cotton. Cotton shipped in India for Europe, and occupying four or five months in transit, should be carefully inspected before it is struck into the hold, to see that there are no marks of mildew or other signs of dampness on the bales, as if stowed in bad condition, much danger may arise on the passage, from spontaneous combustion; this danger is referred to under the heading New Orleans. Cargoes of cotton have been injured and sometimes spoiled by leakage through side ballast ports which were insufficiently fastened and caulked.

211. **Calcutta.** In calculating for ballast for a cargo here, some masters take one-third of the register tonnage as a guide, by which a ship of 900 tons register would require 300 tons of ballast; others say 27 tons of ballast to every 100 tons of cotton. From Calcutta for **China** the bales are about $2\frac{1}{4}$ to $2\frac{3}{4}$ cwt. each, and are carefully weighed on delivery; when taking cotton to China stipulate for 5 per cent. at least of half-bales, if required, with permission to cut or break whole bales in two. Masters should be careful when Chinese labourers are employed that they do not "comb" off the ends of the

bales, or cut a band so that the bale may burst and enable them to steal a quantity of the loose cotton. Lascar crews are capable of performing these tricks when instigated by the bumboat and washer-women who throng the decks if allowed. Lascars have also been charged with setting many ships on fire on their way down the Hooghly; the very large advance of wages (three months, and sometimes six months to England) being a great inducement. The fact that a fire broke out on one occasion immediately under the Lascars' galley, the deck being burnt through there, was very suspicious; it was currently reported that several men were specially retained by the Ghaut serangs, for the execution of such villainous projects, and that they were always clever enough to avoid detection. A cargo of Wagoola cotton from China discharged in the West India Docks, in June, 1864, was found injured, supposed by water injected into it in the country. The cotton was discoloured and heated into large lumps.

212. At **Bombay** cotton is the standard for freight; any article affecting rates, such as a new produce, is stacked, and an estimate is then made of what quantity could be stowed in 50 cubic feet; freight in proportion. The cotton presses are generally on or very near the place (bunder) of shipping; not one exceeds 500 yards distance. The presses are close to the water, because the bales always increase by moving. The powerful presses now in use for pressing cotton, turn out bales (iron-bound) that contain 400 lbs. cotton and measure 51 inches by 24 inches by 18 inches, say 12 feet 9 inches. The ships lie within a distance of two miles; whilst their hatches are opened, and during the stowage of cotton, etc., they are not on any account to have any lights in the hold or orlop. An experienced master says: cotton is shipped all the year round at Bombay, but the **chief season** is in March, April, and May; the new crop begins to arrive in February. The south-west monsoon commences about the 15th of June, and continues till about the 15th of October; during that time a heavy fall of rain occurs, and the wind blows hard with occasional violent squalls. Frequently no cotton is shipped or cargo landed for 10, 12, or 15 days; then comes a break for a few days and the work is resumed. Cotton shipped at Bombay after the monsoons, is generally not so clean as that obtained in dry weather. Between the time of measurement after pressing, and that of being stowed in the hold, cotton is said to increase 5 or 10 $\frac{1}{2}$ cent. The loss of freight at Madras amounts sometimes to 15 $\frac{1}{2}$ cent., in consequence of rolling the bales over the beach. 10 $\frac{1}{2}$ cent. of the bales are supposed to be measured on the bunder at Bombay by the shippers and

captain's dubashes, but this should not be done until they are fairly on board ; the ship ought to have the benefit of the expansion. Masters should strenuously protest against taking four bales to the ton of 50 cubic feet, as they average fully 14 feet each. From **Bombay** to England cotton is almost invariably carried upon a level of stone *ballast* (blue granite) the small being carefully trimmed from the keelson to the bilge, and the large worked into the wings ; it is desirable that the whole should be *put* away in the second height of bales :—cases of cowries and elephants' teeth, with bags of blood stone, work well into the ground tier, especially the latter. When ebony wood has been used for dunnage, ships have laden cotton at Bombay without ballast. The *Naval Brigade*, of 800 tons register, took in 10 tons of ballast to every 100 tons of cotton, which answered well ; she is a crank ship and loaded at Bombay (December, 1863), 3,000 bales, or 800 measurement tons of 50 cubic feet ; her length is 145 feet 6 inches, breadth 28 feet 6 inches, depth 19 feet, and height of 'tween decks 6 feet 6 inches. With this cotton and 80 tons of ballast, she drew 16 feet 6 inches aft and 16 feet forward ; with a dead-weight cargo of coal, 17 feet aft and 16 feet 6 inches forward. The barque *City of Carlisle*, 815 tons register, Capt. PENTREATH, which loaded at Bombay, in February, 1864, had 118 tons of stone ballast with 4,240 bales of cotton and 100 tons (1,200 bags) of linseed, 51 cubic feet to the ton ; her length is 162 feet, breadth 32 feet, depth of hold 21 feet $\frac{1}{2}$ inch, and height of 'tween decks under the beams, 6 feet 6 inches. She drew 18 feet fore and aft ; and on arrival at Havre, in June, 17 feet 8 inches aft and 17 feet 6 inches forward. Her bales received a pressure of about 400 tons, and were then of the density of yellow pine, and handled like stone ; they measured 4 feet 3 inches by 2 feet 1 $\frac{1}{4}$ inches and 1 foot 7 inches, but by the time they got on board they increased 1 $\frac{1}{4}$ to 2 inches ; 1 foot 11 $\frac{1}{4}$ inches became 2 feet 1 or 2 feet 1 $\frac{1}{4}$ inches ; the bales were lashed with native flax, the lashing and bagging weighed 14 lbs., cotton 3 $\frac{1}{4}$ cwt., gross 3 cwt. 2 qrs. 14 lbs. Although the barque stows 1,340 tons of tea she could take in but 1,300 tons of cotton, both 50 feet to the ton. The stone she shipped at Bombay is considered very superior for roads, and sells readily in London for 5s. or 5s. 6d. \wp ton ; it answered the purpose of dunnage in the bottom 16 inches, with wood in the bilges 18 inches, aided by split bamboo in the sides 2 inches, and on the 'tween decks. **Port charges** at Bombay, inwards, £11, outwards *nil* ; **pilotage** in £8, out £8. The *Premchund Roychund*, which registers 1,257 tons, is 216.8 feet long, 34.5 broad, and 22.5 feet deep, loaded cotton in Bombay, left 10th July, and arrived at Liver-

pool 29th September, 1866. She, being very crank, required about 500 tons of ballast—stone ; her cargo consisted of about 6,500 bales, four to the ton, brought off in lighters, and although measured on shore, about three or four bales from each lighter were measured before reception. Those wetted in the lighters or before going in were refused by the ship. The bales were stowed by big stout men from the coast of Africa, called by the seamen “seedy boys.” On arrival at Liverpool she drew 19½ feet aft, 19 feet forward. Shipments from Bombay for **China** are freighted by weight, per candy, in consequence of which the shippers do not press it so much as when freighted by measurement. At **Tuticorin**, vessels lie off five miles, in seven fathoms, and receive cotton from large boats, each containing 50 to 80 bales : the charge for screws is one-third of a rupee per day.

213. **New Orleans.** In the United States, chiefly in the great valley of the Mississippi, the seed of the herbaceous cotton is sown generally in the months of March and April, and its marketable fruit is usually gathered in the period commencing with August and terminating with the year. From **America** to Liverpool cotton requires ordinarily to have at least 6 inches of good dunnage under the ground tier, 9 inches in the bilges, and billet of wood of 6 inches under the lower corner of the wing bales in the second tier ; some consider this dunnage insufficient. In a wooden ship it is customary to put bamboos against her sides ; in an iron ship a mat is generally considered to be sufficient. Where vegetable oil, linseed especially, or tar, is spilt on cotton, afterwards subjected to moisture, **spontaneous combustion** is almost sure to ensue ; it is a saying at New Orleans that there is sufficient oil even in one seed, when crushed or broken, to ignite a whole cargo. When stowing there, soft soap is used to lubricate the sliding boards or the sides and ends of the bales ; occasionally it is also applied to the screws instead of oil, to decrease the risk of spontaneous combustion. If wet, cotton is liable to spontaneous combustion after arrival in England. The American Insurance Companies charge a reduced rate for insuring cotton packed in iron-bound bales, because the hoops resist fire, retain the cotton in a compact mass, and thus prevent the access of air necessary to sustain combustion ; whereas, with rope-bound bales, the hemp becomes charred, the bales burst open, and the fire spreads rapidly. At Mobile, where cotton was destroyed by fire, on board a lighter in the use of the owner, he was held liable ; **MORWOOD v. POLLOCK**, Q.B., 22nd January, 1825. Masters should observe much circumspection while shipping cotton at New Orleans, where the bales are liable to considerable damage by rain and mud ; this has been the frequent

cause of litigation. The same care is required at Mobile and Apalachicola, where cotton is occasionally much exposed to the weather—sometimes for months; it thereby becomes caked and damaged, especially at the latter port. Attention should be given by masters and agents to the shipment of cotton at every port, and when necessary a record should be made at once, to facilitate the settlement of disputes on discharging. It is alleged that lucifer matches are sometimes placed in bales of cotton, by unprincipled exporters, when the cargo is fully insured.* In the **West Indies** the time for sowing is usually from May to September; when the season has been favourable, the cotton is generally fit for pulling about seven or eight months after it has been sown. At **Alexandria** cotton is taken from the shoona (warehouse) at the cost of the merchant, and delivered to the shipmaster on the quay. Porterage, marking, sacking and commission, 1½ piastres p bale; pressing, litgherage, stowage, &c., 7½ to 8 piastres p bale. 100 piastres about £1.

214. In the case *MOSS v. OESTMANN*, Liverpool, May 5th, 1868, Mr. SERGEANT WHEELER declined to admit a charge of £35 6s. 8d. for pressing cotton at **Paraiba** where it was not then the practice to use presses for that purpose. The charge was made under the pretext that it was customary. This so-called pressing consists merely in tying two bags together with the help of a wooden screw-press, of little or no power; in fact, a bale of two bags only measures three inches less than two bags laid side by side, and in the stowing it is of no advantage, as it takes three or four men to handle a bale, while one can manage a bag, and many are cut asunder in order to facilitate the stowage. Lately the shippers have discovered that they incur less trouble and expense by shipping without pressing, but the merchants continue to impose a charge of 360 reis p bag. All that the master can do is to protest; but until a clause against this charge is inserted in the charter-party, protesting will prove of no use. It is however to be hoped that the legal decision recorded above, will diminish, if not abolish, this unjust impost. The charges for stowing are 300 reis p bag cotton; 30 reis p bag sugar; 20 reis p hide; dunnage charged separately. Commission 5 p cent. on freight and disbursements. Freights for cotton from the Fiji Islands were, in

* On Saturday, 31st August, 1867. Capt. ORKNEY, of the ship *Belgravia*, from New Orleans, exhibited in the Liverpool Exchange News Room, a box of lucifer matches, known in America as "telegraph matches." The box wrapped up in cotton, was accidentally discovered by Capt. ORKNEY in a bale of cotton, which was being "packed" on the levee at New Orleans for shipment. Whether placed in the bale by accident or design is not known, but as this is not the first time such a discovery has been made, it is to be feared that, for some unknown reason, a scoundrel placed the matches amongst the cotton, regardless of the fearful destruction of life and property which they might have occasioned.

1865, exceedingly high, and as the cotton, for the most part was uncleaned and unpressed, nearly 75 per cent. of this charge is a clear loss to the shipper. In **China** cotton is carried coast wise in large bags weighing one pecul, and is not pressed, as the Chinese consider that pressing damages the staple. Cotton is also shipped from **Natal** of a very superior kind, it is only half dressed and shipped in large bales of about two to the ton.

215. **Fires in Cotton-laden ships.** Mr. COURT, Secretary of the Liverpool Underwriters, writes 6th December, 1859 :—"I have to report that the origin of the conflagrations on board cotton-laden ships is attributable to various causes, all more or less of a conjectural character,—no means having yet been found of tracing any serious fire to its origin. Fires of minor importance have generally been found to be the result of carelessness. The causes to which these fires are attributable may be stated as follows, viz :—

- 1.—Spontaneous combustion, arising from the presence of oil or grease, or arising from moisture after exposure to heavy rains in the streets of New Orleans.
- 2.—Smoking of labourers.
- 3.—Sparks from steamers on the Mississippi.
- 4.—Wilful ignition of the cargo by the crew.
- 5.—Lightning.
- 6.—Fires in cotton presses.

1.—*Spontaneous combustion* from the presence of oil or grease. In New Orleans, the jack-screws used in the stowage of cotton are oiled in the ship's holds, and the drippings may frequently fall on the cargo; the strong affinity of oily substances for oxygen, and the constantly-increasing surface on which this action can take place, as the oil spreads from fibre to fibre, on so inflammable a material as cotton, make it probable that this is one of the chief causes of fire in cotton-laden ships. Grease was formerly used for stowing the cargoes but it is understood to be now superseded by soap. Vessels from India with cotton often have part of the cargo composed of oil seeds, and as these seeds get crushed under foot on the 'tween decks, and then mixed with the cotton bales, spontaneous combustion cannot be wondered at.

From moisture, after exposure to heavy rains. The heat evolved from damp vegetable fibre, when closely packed, is also known to be the effect of a slow kind of combustion which may possibly at times become so active as to cause the destruction of these cargoes by fire. The progress of fire from this cause is much retarded by the great quantity of heat carried away in the steam which is given off. In consequence of the large accumulation of cotton last season at New Orleans the covered places for storing it were insufficient, and several thousand bales were exposed to the heavy rains of the winter of 1858—59.

2.—*Smoking of labourers*: so far as I can learn, it is the universal practice for labourers among cotton bales, to smoke. Some parties effect to deny that there is danger from this habit. Where its danger is admitted, it must excite surprise that, with so prevalent a custom, conflagrations at sea are not more numerous. In a bale of cotton recently imported into Liverpool, a box of lucifer matches was found underneath the wrapper.

3. *Sparks from steamers*: the use of wood as fuel on board the Mississippi steamers causes numerous sparks to be blown from their funnels, endangering cotton lying on the banks and wharves, as well as that stowed on the decks of steamers and flat boats.

4. *Wilful ignition by the crew*: no such case having been proved, the assertion is, as yet, without corroborative evidence.

5. *Lightning*: when a ship takes fire from this cause it is immediately known; the most recent case is that of the *Oakland*, from Charlestown to Liverpool, which was struck by lightning 19th December, 1858, on the edge of soundings, and entirely destroyed.

6. *Fires in cotton presses*: last season there was a serious conflagration in the New Orleans presses, and fire is supposed to have broken out in some of the cotton subsequently shipped from those presses.

216. **Spontaneous Combustion.** On Monday evening, 5th July, 1862, the crew of the American ship *J. L. Gilchrist*, Captain HEWES, from New Orleans, which arrived at Havre on the 22nd June, with a cargo of cotton, and which was moored at the north side of Vauban passage in this port, perceived a thick smoke issuing from the hold. Thinking that a fire of no great consequence had broken out, they tried to extinguish it without assistance, but after two hours' labour the smoke had increased. The firemen were then summoned, and arrived with ten engines; the sub-prefect and other of the local authorities also came to the wharf. The engines played into the hold, but produced no effect. Attempts were made to discover the exact position of the fire, but the smoke was so dense that no one could descend, and even torches were extinguished. To prevent air from reaching the fire, the hatchways were then closed, excepting just sufficient space to allow the hose of the engines to pass. Although no flames were seen, the fire was evidently making progress, as the cords of the bales were heard to crack. All the ships in the vicinity were removed as far off as possible, and at about midnight holes were cut in the sides of the ship to scuttle her, but the water having entered on one side sooner than the other, the cotton imbibed it, and the weight caused the ship to lean over, and the desired object was not obtained. All night long the smoke continued to increase, in spite of the vast quantities of water cast into the hold, and at seven o'clock in the morning the heat on deck had become so intense that it was deemed advisable to cut away the masts. The smoke and heat continued until four o'clock in the afternoon, when flames burst forth with great violence; they were so strong that in spite of the broad daylight which prevailed, they could be distinctly seen in the town some distance off. Part of the cargo had been removed before the accident; there remained 600 bales of cotton, a quantity of tobacco, and other goods. The fire is supposed to have been occasioned by the spontaneous combustion of some of the cargo.

217. **Damage to Cargo.** Northern Circuit, Liverpool; ship *Frank Boulton*, MOORE v. OWEN. The action was for £316 8s. 4d., value of a quantity of cotton damaged while in the hands of the defendant, for conveyance from New Orleans to Liverpool. Mr. E. JAMES stated that the cotton was bought 2nd September, 1859, at New Orleans, and on the following three days was sampled and weighed. It was afterwards pressed. Defendant received the cotton on board, and gave a certificate that at that time it was in good order, and therefore he was liable for not delivering it in as good order and condition as he received it, unless he was prevented by any of those accidents which relieved the ship-owner from responsibility. In this case it was not pretended that the cotton had suffered from any extraordinary causes.

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It was taken, when sampled and weighed, to the Crescent City Press, where it was subjected to the usual pressure, and then conveyed to the ship lying off the levee. Very few of the bales were found to be in bad condition, and those were sent back to the pickery, and replaced in proper order for shipment, and altogether 948 bales were shipped. When the *Frank Boulton* arrived in Liverpool, a large number were found to be in a very damaged state; they were caked on the outside to the extent of three to five inches. When packed, the cotton was quite dry, and therefore defendant could not have the excuse of saying that it was what was called "water packed." Besides the bales which were caked, a large number were almost stripped of canvas, and the outside was ragged and mouldy, which was attributed to the moisture the bales had imbibed, and the deficient ventilation in the hold. The question for the jury would be, how was the damage occasioned? Defendant suggested in his pleadings that the cotton had suffered by being improperly packed at the plantations, that it had been water packed; but if that had been the case they would naturally expect to find the damage in the centre of the bales as well as on the outside, whilst the fact was that the caking from the moisture was only found four or five inches from the outside. Plaintiff contended that the damage was occasioned by the cotton having been left on the levee after being delivered to the care and charge of defendant, that it was placed in the mud, traces of which were found on the bales when discharged. Mr. A. BAKEWELL, of New Orleans and Mr. BELSHAW, cotton broker of Liverpool, were examined in support of plaintiff's case, and the amount of damage was proved as stated. A number of depositions were read, and it appeared that witnesses had been examined at New Orleans and at Malta.

Mr. MELHUISE, for the defendant, endeavoured to show that the cotton had been damaged before it was delivered to the master. The bales appeared when shipped to be in good condition, and he contended that the damage was attributable to water-packing, and the exposure of the bales in the press-yard for some time, to heavy rain. Mr. HARRISON, principal surveying officer of Stanley Dock, said "he had examined the bales, and thought they were country damaged. Very frequently bales came in the same condition. If they were shipped in that state there would be considerable heat generated, which would rot the covering, as was the case with the bales in question. They came muddy outside but uninjured inside, and if the bagging was in good condition, the cotton was passed as being externally in good condition although it might be muddy." In cross-examination he admitted that if the bales were laid in mud, the same appearances as those noticed might be produced. Capt. PERRY, of the American ship *Cambria*, said: "if the bales had been exposed to rain in New Orleans, they would dry very quickly on the outside; and it would be impossible without opening them to ascertain if the centre was dry. He had carried bales of cotton which were found with the outside rotten and decayed on arriving in port, although the bales appeared to have completely dried before being shipped."

The judge, Baron WYLDE, observed that the great question for the jury was whether the species of damage which the cotton had sustained had resulted from its being left in the mud, or by its having received a heavy wetting from rain. The plaintiff said they were damaged by being laid in the mud, but the defendant said that they were wet for five or six inches, which was more serious than could have been caused by being placed in the mud. It was important to consider that some of the plaintiff's witnesses described the cotton as laying exposed for several days to the weather. They must take that fact into consideration, coupled with

the fact as proved by the plaintiff, that the cotton lay for some days in the mud and slush on the levee. Probably they might come to the conclusion that the damage was attributable to both these causes. Verdict for plaintiff—damages £193 11s. 6d.

218. **Damage to Cargo.** Boston, U.S.; ship *Escort*, *FAREWELL v. BRYANT*. An action on a bill of lading acknowledging the receipt in New Orleans of 108 bales of cotton "in good order and condition" "to be delivered in like good order and condition." Defendant added before signing, "weight and contents unknown." The cotton came from Alabama, and was screwed in between decks. The ship was detained twenty-one days above the bar of the Mississippi, and was eighteen days on the passage to Boston. The hooks used in discharging had torn the bagging and a portion of the contents which were then observed to be in bad condition, stained with mud, decayed, caked, and "staple-drawn," to above an inch; the bagging rotten and some of the marks undistinguishable. The damage was estimated at 7 dollars 75 cents per bale, on 103 bales. Plaintiff further proved that the cotton had been through the New Orleans' press, and was conveyed on drays to the plank wharf built on the levee, that while loading some rain fell, and that there was mould upon the cotton under the bagging.

Defendant stated the wharf was a flooring of planks each less than a foot wide with spaces between them; and was three feet or more above the earth of the levee, and was clean, and water would not stand upon it. The *Escort's* cargo was covered with tarpaulins by night or when it rained, and the other part, 807 bales, came over clean. That the cotton on the surface of the 108 bales was in folds with mud in the creases, although otherwise in good condition. Several surveyors stated that cotton packed like this, between decks, in a tight ship, while wet, would not become dry even by heating, during such a voyage.

Mr. DOIDGE argued that the cotton was not injured while in charge of defendant, so much mud could not have been accumulated on the wharf. Mud which got on the bales after pressing, would have remained outside, leaving only stained water to penetrate the cotton. The creases filled with mud suggested that the sides of the bales had been previously covered, and that in pressing, the mud was folded in with them. Cotton could become mouldy and dry again between Alabama and New Orleans. In putting the cotton into the ship the mud might be distributed and the marks erased; some marks might be removed when the bagging was torn. It was more likely that mud was gathered in the yard after pressing, than at the wharf.

Mr. RANNEY argued that if the cotton was injured to the extent discovered on discharging, it must have been discovered before loading. No doubt it was wetted on the wharf and so stowed; by heat or some chemical operation it dried and the bagging rotted; or else defendant had negligently acknowledged the cotton to be in good order when it was not so.—Verdict for defendant.

219. **Freight.** Court of Common Pleas, 18th November, 1863. Before Lord Chief Justice EARLE and Justices WILLIAMS, BYLES, and KEATING. *SHAND v. GRANT* and another. This was an action to recover back £88 alleged to have been overpaid by the plaintiff in mistake, in paying for the freight of 700 bales of cotton from Madras to Liverpool in 1861. Messrs. SHAND & Co., merchants, of Liverpool, to whom the cotton was consigned, were to pay as per bill of lading, in the margin of which the measurement was given thus: 200 bales measuring 50 tons 5 feet 6 inches at £2 5s. 7d. per ton of 50 feet. The cotton was taken to SCOVELL's wharf in London, and on being landed was found, as is not unusual, to have increased in

bulk by swelling out. The freight note was therefore altered in accordance with the measurement, and on being presented by one of the defendants to the agent of the plaintiff in London, he not having the bill of lading to compare the freight note with, and believing it to be correct, paid the amount, which was £88 more than according to the bill of lading he ought to have paid, and this sum the plaintiff sought to recover. When the accounts were forwarded to Madras, the discrepancy between the two measurements was discovered, and hence the present claim. It was contended for the plaintiff that, this sum having been paid in mistake, the plaintiff was entitled to recover it back. For the defendants it was contended, first, that they were entitled to the increased freight by reason of the increased bulk of the cotton; secondly, that the money had been paid by the plaintiff with the means in his hands of knowing whether it was right or not, and that he did it under no mistake; and thirdly, that there was a misjoinder of the two defendants, one only, at all events, as the agent of the consignor, being liable. The COURT were of opinion that the name of one of the defendants must be struck out.—Verdict for plaintiff.

220. Deck Load. At the Liverpool Assizes, 14th August, 1865, before Mr. Justice SMITH, an action was tried, *MELLOR v. CHAPPLE*, to recover £5,100, value of 102 bales of Egyptian cotton, which defendant undertook to convey for plaintiff from Alexandria to Liverpool, "casualties and perils of the sea excepted." Plaintiff was a merchant carrying on business at Liverpool and Alexandria, and defendant was a shipowner. It was complained that defendant, instead of stowing the cotton in question below, carried it on deck, and the consequence was that during foul weather on the passage, the cotton had to be thrown overboard. The rate for the cotton below deck was 1½d. 7 lb., whereas on deck the rate was only 1d., the difference being about sufficient to pay for the extra expense of insurance. If goods were to be carried on deck from Alexandria, it was the custom to specify them in the bill of lading as "stowed on deck at shipper's risk," but if they were to be carried below there was no specification in the bill of lading. Mr. LEYLAND, from Messrs. BIBBY & Co., deposed that his firm were in the habit of carrying cotton from Alexandria to Liverpool, and it was the custom when cotton was to be carried on deck distinctly to specify it in the bill of lading as "stowed on deck at shipper's risk;" whereas if it was to be carried under deck a "clean" bill of lading was given, there being no specification as to how it would be carried. There was a difference in the rate of freight for cotton on deck and cotton carried below deck. Other evidence was adduced to show that this was the custom with regard to cotton shipped from Alexandria, and that the general rate of freight was 1½d. 7 lb. for cotton carried below, and 1d. 7 lb. for cotton on deck. The witnesses, in cross-examination, denied any knowledge of the same rate of freight governing the carriage of cotton either on deck or below. For the defence it was contended that the cotton in question was to be carried on deck. The jury gave a verdict for the plaintiff.—Damages £4,330.

Proportionate Tonnage. The following quantities are computed to occupy a space of 850 cubic feet, or 1 keel, viz. 8'330 tons of New Orleans and Mobile all compressed, 9'166 ditto best carrying ships, 4½ ditto Charlestown and Savannah not compressed, 7 ditto Pernambuco and Maranhão, 9'700 ditto Alexandria all compressed, and 5 tons ditto not compressed. Vessels from Pernambuco and Maranhão generally stow 10 7 cent. more than half the register tonnage, part compressed, say as above.

Tonnage for Freight. Bengal, Madras, and Bombay 50 cubic feet in bales; Madras cotton piece goods 50 cubic feet; for mode of measurement see bale goods; New York and Baltimore 40 cubic feet. In the northern ports of the United States it is the universal practice to pay freight on the gross invoice weight; it is nevertheless advisable for masters to have it expressly stated so on the bill of lading. It is the invariable rule to pay freight on the net weight of cotton landed at Liverpool from the Southern ports. At Bahia 29 arrobas (8½ cwt.) Maceio or St. Francisco, or 27 arrobas (7½ cwt.) Cachoeira, go to a ton.

Proportionate Rates. When wheat is freighted at 1s. ½ quarter, New Orleans compressed is rated at 11s. 7½d. ½ ton, Charlestown not compressed 20s. 5d. Pernambuco compressed 13s. 10½d., and Alexandria compressed 10s. Another authority says, when wheat is freighted at 7s. ½ quarter, cotton in loose Egyptian bales is rated at 67 ½ ton of 20 cwt., or ¾d. ½ lb. When in bales pressed by machines one-half less is paid than when in loose Egyptian bales. These rates are considerably altered since steam communication with Egypt has been so much developed. Cotton is generally freighted @ ½ lb.

Bales. The average weight of bales of cotton of all descriptions, imported in 1856, was 407 lbs. The following are the average weights and measures per bale of the different kinds received at Liverpool in 1856:—

	lb.	ft.		lb.	ft.
Mobile	564	33	East Indian.....	383	15
New Orleans	455	32	Egyptian	245	27
Upland	390	22	West Indian	212	25
Sea Island	333	35	Brazilian	182	17

Another authority gives the weight of a bale of cotton wool from Virginia, Carolina, Georgia and the West Indies, 300 to 310 lbs.; New Orleans and Alabama 400 to 500 lbs.; East Indian 320 to 360 lbs.; Brazilian 160 to 200 lbs.; Egyptian 180 to 283 lbs.

The gross weight of a bale of **Egyptian** cotton at Alexandria averages 230 rottolo or 228·07 lbs., and allowing 12 rottolo as tare for sacking and cordage, the net weight of the bale will be 219 lbs. The quintal or cantaro 36 okes. Alexandrian "pressed bales" mean hydraulic pressed: MILVAIN v. CASSAVETTI, Newcastle 3rd March, 1851. The cantar of **Turkish** cotton is stated to have been fixed at Constantinople in 1836, at 100 rottolo. Some make the quintal or cantaro 44 okes, others 45 okes=127·2 lbs.

India cotton—2 nugga are 12 maunds=315 lbs. 15 oz. 10 dr. A Calcutta bale weighs 2½ peculs, and 5 bales make about a ton of 50 cubic feet; a Bombay patent bale weighs 3 cwt.; 2½ bales are consequently equal to a candy of 7 cwt. A pecul is 133½ lbs. English.

TARES AT HAMBURG.

Georgia, Tennessee	}	America and West India }	4 ½ cent.
Alabama and Texas			
New Orleans and Mobile ...			
St. Domingo			
Bahia			
East India	}	Squ, with rope	6 "
		Serons	8 "
		East India ...	8 "
		In leather.....	12 "

221. **COWRIES**, small shells from the Maldive Islands; 3,300 are worth a rupee; they are usually packed in boxes of 50 lbs., which

are shipped for broken stowage; they may be placed in any position not likely to injure bags; see sugar. Bengal, Madras, and Bombay ton 20 cwt. in bags; Bombay 50 cubic feet in cases.

222. CREOSOTE. Ships taking creosoted railway sleepers to Bombay have been refused tea and other high-class goods for freight. In 1864, the *Randolph*, Capt TAYLOR, belonging to Mr. DUGGUA, of Plymouth, from London, discharged a cargo of creosote timber for bridges, some railway sleepers, &c., in Table Bay and then took in general cargo, including some meal and flour, for Algoa Bay. Although enveloped in old sails, &c., the meal and flour (after a passage of only three days) were so injured by the creosote, which had been impregnated in the hold planking, that a considerable loss fell upon the owners.

223. CREWS. The following is the scale for vessels not carrying passengers:—

COASTING VESSELS.

SAILING VESSELS.		STEAM VESSELS.			REMARKS.
Gross Tonnage. Per register.	No. of Men.	Steamer's Nominal Horse-power.	Engine- room Crew.	Deck Crew.	
100	4	100	6	6	The number of hands are for men all told.
150	5	200	8	8	
200	6	—	—	—	

FOREIGN VESSELS.

SAILING VESSELS.		STEAM VESSELS.			REMARKS.
Gross Tonnage. Per register.	No. of Men.	Steamer's Nominal Horse-power.	Engine- room Crew.	Deck Crew.	
100	6	100	8	8	The <i>engine-room crew</i> include engineers, firemen, stokers, and every one for this department.
150	7	200	12	12	
200	8	300	14	14	
300	10	400	17	17	
400	12	500	22	22	
500	14				
600	16	The <i>deck hands</i> include all persons other than engine-room crew, but do not include servants; if passengers are carried the hands should be men, not boys, and vessel rigged with the modern appliances.			
700	18				
800	20				
900	22				
1,000	25				
1,500	35				
2,000	45				

And one adult seaman for every 30 tons over and above 364 ; one able seaman to be employed in the place of two apprentices, if required ; no apprentice to be considered an able seaman until the fulfilment of his agreement as an apprentice. There is no legal means of enforcing this scale, but the great majority of vessels in the coasting trade conform to it, while a few exceed it. The crew of a Dutch ship, from 40 to 50 lasts, is 7 sailors and a swabber ; from 50 to 60 lasts, the crew consists of eight men and a swabber ; and thus increases at the rate of one man for every 10 lasts ; a ship of 100 lasts has 12 men, &c. 158 Dutch lasts 300 tons English.

224. CUBEBS, the dried berries of the *piper cubeba* ; Bombay ton 12 cwt.

225. CUBIC MEASURES ; 1,728 inches 1 solid foot, 27 feet 1 solid yard.

226. CUTCH ; see catechu and gambier.

227. CUTLERY and hardware goods are packed in strong casks, which should be well hooped to support any pressure ; they are considered water-tight, and for very fine goods going to Australia or India, are lined with soldered tin or zinc. They should be kept apart from liquids and all articles soluble in water, such as sugar, salt, nitre, &c.

228. DAMAGED GOODS. Unless damage to a cargo can be traced to "any actual fault" on the part of the owner of the ship, he is not liable in respect of it, and the owner of the cargo cannot deduct anything from the freight to cover his loss. By 15 & 16 VIC., c. 107, there is an allowance up to three-fourths of the *duty* upon all descriptions of damaged goods except *cocculus indicus*, *nux vomica*, rice, guinea grains, lemons, spirits, corn, grain, meal and flour, opium, sugar, cocoa, oranges, tea, coffee, pepper, tobacco, currants, raisins, wine, and figs, upon which no allowance is made. Nevertheless if a bill of lading has been given for goods in good order when received, should they be in bad order when delivered, the *onus* will be on the master to prove that the damage did not occur through any fault of the ship or ship's servants.

229. DANGEROUS GOODS. By sec. 329 Merchant Shipping Act, 17 & 18 VIC., c. 104, it is enacted, that no person shall be entitled to carry in any ship, or to require the master or owner of any ship to carry therein any aquafortis, oil of vitriol, gunpowder, or any other goods which, in the judgment of such master or owner, are of

a dangerous nature ; and if any person carries or sends by any ship any goods of a dangerous nature without distinctly marking their nature on the outside of the package containing the same, or otherwise giving notice in writing, to the master or owner, at or before the time of carrying or sending the same to be shipped, he shall for every such offence incur a penalty not exceeding £100 ; and the master or owner of any ship may refuse to take on board any parcel that he suspects to contain goods of a dangerous nature, and may require them to be opened to ascertain the fact. By sec. 38, 25 & 26 Vic., c. 63, the provisions of the above section are extended to Foreign ships when within the limits of the United Kingdom.

230. A very large number of articles of freight may properly be placed in this class, as directly or indirectly they may become sources of danger ; but, as under the heading of each separate article, these circumstances are adverted to, it will be sufficient here to notice only those substances which are more generally recognised as dangerous ; see the article camphine, gunpowder, and ignition ; for a list of those articles which are peculiarly dangerous on account of their liability to take fire, either with or without access of flame, see spontaneous combustion.

231. Sulphuric acid or *oil of vitriol*, being portable only in glass carboys or earthenware jars is peculiarly liable to be spilt, through accidental breakage. Care should therefore be taken to see that the carboys or jars are properly packed with straw, and the stoppers fastened down. The packages are usually baskets, but light wooden tubs are much better ; especial attention should be given to the bottoms of the packages, as, although they may look very well elsewhere, they may be defective there, from standing in damp places or from leakages of acid over the mouth of the carboy, in pouring out. Directions are given elsewhere for packing in the hold. Sulphuric acid, nitric acid, hydrochloric acid and chloride of antimony (butter of antimony), are all capable and will inevitably destroy any delicate goods near. Cotton and similar articles will be burnt and rendered valueless if brought into contiguity.

232. In cold weather brown acid or *sulphuric acid*, specific gravity 1.75, should be carefully protected from the cold, with a covering of straw or any other light material, as it freezes much sooner than water, viz. at 42° Fahrenheit, water freezing at 32°. It is also, in freezing, more rapidly converted into a solid mass ; and, after it is once frozen, it takes a very long time to thaw. Whether partially or entirely frozen, it is very dangerous for moving about, indeed it becomes almost impossible to do so without breaking the carboys.

This acid does not of itself give off any vapour, but it has a powerfully corrosive action on almost every substance that it can come into contact with whether it be mineral, metallic, animal or vegetable. On mixture with water, great heat is given off, and the resulting weaker acid is more rapidly corrosive than the strongest acid ; if, therefore, a package be broken and the acid spilt over any substance, it is better not to throw water over it until sufficient is at hand to have a large excess ; it is less dangerous to leave it alone for a short time than to throw only a small quantity of water over it ; so in case of a man having even the strongest acid spilt over him, no injury will accrue if he have sufficient confidence to wait until he can be deluged in water. A small quantity of water may scald so terribly as to cause death.

233. **Muriatic** and **nitric** acids are packed in the same manner as sulphuric acid ; as they are both volatile acids, it is especially necessary to take care that carboys containing them are carefully stoppered to prevent their vapours acting on surrounding bodies. The acids and the vapours arising from them are both very corrosive of metals as well as of other bodies. Chalk, whitening, limestone, lime, calcareous or limestone sand, soda, soda ash or alkali, barilla, potash or pearlash,—any of these bodies, separately or together, will neutralize the action of these acids. **Acetic** acid is also a volatile acid producing the same effects as nitric and muriatic acids, in less degree. A ship carrying a quantity of either of these acids should be provided with a few cwt. of slacked lime in barrels ready for use, in case of accident, for the absorption and neutralization of the spilt acid. Very corrosive vapours are also given off by chloride of lime, but see the article thereon.

234. White **Arsenic**, or arsenious acid, in powder, should be kept apart from articles of food ; the packages are heavy, and if, being injured, any of the powder be sprinkled on them, serious consequence may result. For danger from similar substances, see poisonous bodies. Liquor ammonia or spirits of hartshorn, is packed in carboys or jars ; its vapour is exceedingly penetrating, and although alkaline and not acid, has a powerful action on articles of bronze or brass. If a package be broken, the vapours should be carefully avoided, as they are so powerfully irritating as to cause death by a sudden full inspiration of them. Any of the acids mixed with water but more especially muriatic acid, will quickly neutralize it and render it innocuous. Serious damage may also be occasioned by substances which are soluble in water, being dissolved, and thereby diffused through or over the cargo ; see substances soluble in water.

235. As **Railway Sleepers**, covered with a solution of coal tar, naphtha, &c., cannot be stowed with general cargo without danger, a master might refuse such sleepers, although his charter-party bound him to "receive all such lawful goods as the said charterers shall send alongside." **Gun cotton**, a dangerous substance used for blasting purposes is sometimes shipped as "prepared cotton" and as "samples of cotton."

236. **Apothecary Wares.** Mr. STEWART, attended before the LORD MAYOR 11th October, 1860, to answer a summons from the PENINSULAR AND ORIENTAL STEAM NAVIGATION Co., charging him with unlawfully sending "certain goods of a dangerous nature, to wit, one gallon of spirits of ether nitre and one pint of spirits of ether sulphur, without distinctly marking their nature respectively on the outside of the packages, or otherwise giving notice in writing to the master or owners of the said ship at or before the time of sending the same to be shipped, contrary to sec. 329 Merchant Shipping Act, 1854," which is given in full at the commencement of this article. Mr. T. ATKINSON stated that on the 29th September the defendant sent four packages to Southampton. Before the goods were shipped he should distinctly prove that in a printed form supplied to defendant at the offices of the Company in Leadenhall-street, he described the contents of the packages as "apothecary wares." The boxes were marked "S," within a diamond, and "Glass," "Singapore," and "Apothecary wares," and were sent by rail to Southampton on the 1st of October, and shipped on board the *Pera*, which was to sail on the 4th. Providentially on the 3rd a leak was discovered, and in consequence of the peculiar character of a vapour which rose from the box, it was opened and found to contain three jars, one of sweet spirits of nitre, which was broken, one of ammonia, and one of balsam copaiba; the two last were not considered dangerous. The boxes were immediately landed and the circumstance telegraphed to defendant, who replied that he did not know the contents of the packages, that he had them from Messrs. DAVY & M'MURDO, manufacturing chymists, in Upper Thames-street, and he produced their invoice in which the items spirits of nitre and sulphuric ether appeared among others. What the Company contended, and not unreasonably, was that Mr. STEWART should have had the cases marked "Dangerous," or have given some intimation of their contents. Besides they submitted that it was wrong to pack such articles in straw and in wooden boxes, as these were packed, that the usual plan of packing dangerous articles in sawdust and in tin cases, hermetically sealed, should have been adopted. He should call Dr. LETHBY, who would describe the exceedingly volatile, inflammable and dangerous character of both the sweet **spirits of nitre** and of the **sulphuric ether**. Had such articles, the tendency of which (besides their inflammable nature), under certain conditions of temperature, was to burst the vessels containing them, been by any chance placed near the engine-room of the ship, the consequences to all on board might have been horrible beyond description. It would be unwise to fetter the trade of this great metropolis by unreasonable restrictions; but this was one of those cases in which the lives of scores of human beings at sea, and far beyond the reach of aid or possibility of escape, might any day be placed under circumstances of fearful peril. People going distant voyages beyond seas in the Company's vessels, were absolutely at the mercy of persons so incautious and careless as defendant had been, and it was for the purpose of

reading a lesson to all such persons that his clients had felt it their duty in the public interest more than in their own, to prefer this complaint.

Dr. LETHBY said : " From the course of my scientific enquiries I am acquainted with the properties of *spiritus ætheris nitricæ*, or, as it is popularly called, sweet spirits of nitre. It is a mixture of one part of very volatile ether, and four of spirits of wine. You cannot freeze it. Its specific gravity is about two-tenths less than that of water, or as 8 to 10. It mixes with water, but has a tendency to float unless agitated. It is volatile at ordinary temperatures. The pure ether itself boils at a temperature of 70°, which is below the temperature of a ship's hold in a warm climate. The spirit of nitre begins to boil at a temperature of 130° and gradually rises to 170°. There would be two effects from the leakage of a vapour so compounded mixing with the atmosphere—first the injurious effect to those inhaling it, for, like chloroform, it is a powerful agent in producing insensibility, and it will take fire at a point several yards away from the surface of the liquid, which I can prove by an experiment. (The witness put into a dry quart bottle in court about 20 drops of the *spirit of nitre*, and in a few minutes the vapour diffused itself through the atmosphere of the bottle. He then applied a light to the mouth of the bottle, when a sheet of flame passed through the liquid to the bottom of the bottle with a slight explosion). If it mixes with about 30 parts of atmospheric air, I find it forms a most powerful and explosive compound. A gallon of the liquid spirit of nitre will produce about 400 gallons of vapour, and this with 30 times its bulk of air would form 2,000 cubic feet of a powerful explosive mixture. The spirit of *sulphuric ether*, commonly called HOFFMAN'S anodyne, is a mixture of one part of pure ether and two parts rectified spirits of wine, with a little essential oil of wine. Its properties are essentially the same as the other. It is a powerful narcotic. The spirit of nitric ether is a little more volatile than the sulphuric ether. I can form no opinion as to the temperature of a ship's hold on a voyage to India. Cases packed like this one, and containing such articles would be dangerous in a warm place in the hold. If by any chance they were placed near the engine room, where the temperature was high, the spirit might reach the boiling point and burst the bottle."

Cross-examined by Mr. NICHOLSON.—It is pure nitric acid that boils at 70° It would not make much difference if the nitric ether had a specific gravity of 8.50, instead of 8.30. The boiling point of every liquid means the atmospheric pressure of its vapour on the containing vessel. If a case so packed were exposed in the hold of a vessel to a temperature of 90° it would be a mere question of time—of a few hours or days—for the heat to reach the bottle.

Mr. GILLSON, second master, stated that the temperature on the deck of the *Perse* at Alexandria in the month of June, ranged from 93° to 97°. He did not keep a register of the temperature in the hold at the time, but in the engine-room he had known it as high as 120° and even above that.

Mr. NICHOLSON said the simple facts as respected Mr. STEWART, were that he received a letter from a friend, a surgeon in Singapore, requesting him to order certain goods from Messrs. DAVY & M'MURDO, of Upper Thames-street; that he did so having no knowledge of the properties of the goods; and that he trusted to their being properly packed by that firm. He himself took no part in their packing or shipping. He had merely handed the list sent from Singapore, to Messrs. DAVY & M'MURDO, and they packed the goods and received the money for them. As regarded the word "dangerous," he (Mr. NICHOLSON) submitted that that was a relative term, depending on circumstances.

The LORD MAYOR said it appeared to him that the section of the Shipping Act, under which this complaint was preferred, had been violated. The evidence of Dr. LETHBY fully sustained that opinion, showing as it did the very dangerous and inflammable nature of the chymical compounds which had formed the subject matter of this enquiry. It was fearful indeed, to imagine the terrible consequences which might have ensued from the explosive and inflammable character of the contents of the packages in question. He felt, without wishing to exaggerate the case, that the statute had been clearly infringed, and that being so he was bound to inflict a penalty on the defendant. He was induced, however, to believe, from the highly respectable character of the Company, that their object in instituting this proceeding was not to put the law in motion in its highest vigour with regard to penalty, but that it might operate as a warning to others dealing with the shipment of such inflammable materials. He hoped that the publicity that would be given to the inquiry would secure the end which the complainants had in view; and, under the circumstances, he should call upon the defendants to pay a fine—not of £100, which he was empowered to inflict—but of £10, believing that that would meet the justice of the case and satisfy the Company.

237. **Photography.** A case belonging to a passenger, a photographic artist, was observed (5th October, 1867) smoking in the hold of the *Countess of Elgin*, lying in the East India Docks. When opened, several bottles of acids were found broken. She left the next day with a number of emigrants, and but for this timely discovery, all on board might have perished.

238. **Aquafortis.** Before the magistrates at Liverpool, in July, 1863, Police Inspector MAUDSLAY, stated that in the barque *City of Kandy*, lying in the Prince's Dock, he found a bottle of aquafortis smoking, which, with a number of other similar bottles contained in five casks, were shipped by Messrs. TWEEDIE, RENNIE, & Co., who alleged that they were sent to them as "drugs." The goods were not marked as combustible or dangerous; no notice had been given to the police or the master, in conformity with the provision of the Mersey Docks Act, 1858, sec. 215. Fined 20s. and costs.

239. **Ether.** On Sunday night, 27th July, 1862, a fire broke out in the *Empress Eugenie*, 653 tons, lying in the London Docks. The ship is a general trader, and was loaded with miscellaneous stores. The accident arose from the explosion of a bottle of ether, which, becoming ignited, the liquid flame rushed into about twelve cases of lucifer matches, setting them also in flame and throwing up a strong sulphurous vapour. The engines of the Dock Company and others were soon in attendance under the direction of Capt. SHAW, when the fire was happily prevented from extending, but it could not be extinguished until a case of ether and twelve packages of lucifers were destroyed and the main hold of the ship severely scorched.

240. **Benzine.** On Tuesday, 25th August, 1865, a fearful scene occurred on board the steam-boat *Agrippina*, then on her passage up the Rhine from Rotterdam. One of a basketful of bottles containing benzine was broken, and the inflammable stuff ran down the deck coal-spout into the engine-room; a volume of smoke shot up instantly as high as the top of the funnel, and one of the paddle-boxes, the smoking-room on deck, and the conductor's room, with all his papers were soon destroyed. There were fifty passengers on board, and it may be easily conceived that terror and disorder prevailed all over the vessel. The engineer had the presence of mind to reduce the speed at the outbreak of the fire, but the west wind carried the flames across the deck, the other paddle-box soon caught, and all

communication between the fore and after part of the vessel was thus cut off. On the after part, besides some passengers, there were only the steersman and ship's cook; the latter cut down the deck-awning to prevent it from taking fire, and the boat was launched to save the passengers. Fortunately a steam-tug was near; her crew rowed quickly to the burning vessel. The passengers having been landed, the fire was extinguished in the course of half-an-hour.

241. **Vesuvians.** In October, 1863, Messrs. RICKABY & HARDING sent to the King's Dock at Liverpool for shipment on board the *Pepita*, five cases of vesuvians, without being properly marked. They were rolled from the wharf, and one of them, a barrel, ignited, and the contents became known. The men employed were alarmed, but a policeman obtained a pole and shoved the case overboard. Shippers were fined £5 for not marking the cases properly, and £2 for omitting to give notice to the dock-master.

242. **DATES**, a fruit shaped like a large acorn. The date or palm tree is cultivated on the African coast of the Mediterranean, in Arabia, and Persia. From Morocco to Gibraltar the common are in serons 150 to 200 lbs., and the fine in cases and barrels of various weights; they may be safely carried in a cabin or saloon. At Alexandria they are in long narrow barrels about 2 cwt. each, and should be stowed in the 'tween decks, or if in a steamer, high up forward; when wet they emit a strong gaseous vapour. In the Hedjaz, Arabia, the new fruit called *ruleb*, comes in at the end of June, and continues two months. The ship *Asshur*, 460 tons, Capt. W. P. NEWMAN, belonging to Mr. A. HECTOR, of Barge Yard, Bucklersbury, left the Gulf of Persia 3rd November, 1866, with a cargo of dates and wool, and discharged same in St. Katherine's docks in March, 1867. She is 146·8 feet long, 26·5 broad, and 17 feet deep. Her hold was dunnaged with date wood and double matted; bottom 9 inches, bilge 13, sides 2½. The dates were packed in mat baskets 18 × 14 × 14 inches, weight 140 lbs.; in all 550 tons of 20 cwt., stowed chiefly below the beams; there was a loss of weight of about 12 per cent. on the passage home. The wool (in the 'twixt decks) was in bales 50 × 30 × 28 inches, averaging 400 lbs., say gross 68 tons or 190 freight tons of 50 cubic feet; the quality was rather coarse, the bales were pressed by hydraulic power; each had six iron bands. So laden she drew 15 feet 6 inches fore and aft, and on arrival 14 feet 3 inches forward, and 14 feet 10 inches aft; with a dead-weight cargo 15 feet 10 inches; best trim 15 feet. The cargo was laden at Bussorah a port in the north of the gulf; **pilotage** in or out 12s. 6d.; **no port charges**. The **season of shipment** of wool and dates at Bussorah is in October and November. Bengal, Madras, and Bombay ton 20 cwt. wet, 16 cwt. dry.

243. **DEAD FREIGHT.** The damage payable by one who engages to load a ship and fails to do so.

244. **DEAD WEIGHT.** This term applies to all goods, the cubical contents of which are less than 40 cubic feet to the ton weight. It is sometimes agreed in charter-parties that coal shall not be considered dead weight. When a vessel is chartered for a lump sum or for a general cargo, the amount of dead weight and the draught of water to which the vessel may be loaded, should be stated in the charter-party.

245. **DECK LOAD.** All cargo carried on deck should be so stated in the bill of lading, otherwise the ship may have to pay for loss or damages should such arise.

246. All spaces on deck, not included in ship's register tonnage, are liable to dues if any timber, stores, or other goods are carried thereon : see Act of 1876, sec. 23. This section does not apply to home-trade ships, that is trading to or from the United Kingdom to any place between the River Elbe and Brest.

247. **Deck cargoes of timber.** After 1st November, 1876, no British or foreign vessel arriving in the United Kingdom, from any port beyond the limits of the United Kingdom, between the 31st October and 16th of April in any year, shall carry deck loads of timber, any square, rounding, waving, or other timber, or pitch pine, mahogany, oak, teak, or other heavy kinds. Any master, and the owner if privy to the offence, whose vessel brings timber or other heavy wood, or more than three feet high of deals or light wood, will be liable to a penalty of £5 for every 100 cubic feet so carried (maximum penalty £100), unless it can be shewn that the vessel sailed in time to have arrived before 31st October or 16th April, as the case may be : see Act of 1876, sec. 24. The penalty would be cumulative under sec. 23 and 24. A master may carry any wood goods on deck on account of springing of any leak or of other damage to ship received or apprehended ; he may carry five spare spars or store spars whether made or not made. The Act does not apply to vessels that only put in to the United Kingdom for stress of weather or for repairs, or for other purposes than the delivering of cargo.

248. **Tallow.** Before the LORD CHIEF JUSTICE, in the Court of Common Pleas, 8th July, 1863, CORRY obtained against ROBINSON a verdict of £466 2s. 8d. value of 56 casks tallow, part of the deck load of the steamer *Era*, shipped at St. Petersburg and thrown overboard to lighten her when on her voyage to London. She went ashore on the Coast of Sweden. Plaintiff shipped in all 300 casks for which a "clean" bill of lading was given. Under the ordinary policy the underwriters were not liable for "jetsam" on deck, and the question at issue was whether the shipowner was not bound to insure goods stowed on deck, and so protect himself from loss when the fact was not stated in the bill of lading or notice given to the shipper. Defendant relied on a custom in the Baltic trade

of carrying (deck) tallow cargoes and not mentioning the fact on the bill of lading. The motion to set aside the verdict for plaintiff was argued 9th November, and refused by the CHIEF JUSTICE.

249. DEFICIENCY OF CARGO. In the article mate and under several other articles, the subject of deficiency is referred to incidentally. It is one of the most important subjects connected with the shipping interest, and appeals are constantly made upon it to the editor of the *Gazette*.

250. An Exeter shipmaster complained, 12th January, 1857: "I brought four packages gin, under bond from London; on delivery, three bottles were missing and the value charged to me: they may have been removed before shipment. Can I, as last hand, be held responsible, and if so, can I not hereafter claim to see contents? I once received a pipe of wine apparently short, and got a cooper and a witness, who found four gallons deficient; the owners threatened to fine me for raising the bung." Answer: "the master has a right to be satisfied that the contents are truly stated, as per bill of lading, but not to open unless in the presence of the shipper or his agent: the proper time is when the package is tendered to the custody of the ship;" see wastage. Another master says, 3rd December, 1857: "A vessel, 140 tons register, takes in coal, and the master, judging by her capacity and draught that she has her complement, signs the bills of lading. Heavy weather compels him to throw overboard five to eight tons, which is entered in his log. On discharging at Demerara, the coal was put into waggons and guessed. The consignee stated that the cargo was 28 tons short, and struck off £40, the value of the coal there." Arbitration is recommended: the master should have had a witness to the quantity thrown overboard, who should have attested the same in the log. The cargo should have been surveyed previous to discharging, and a protest entered. The owner is not obliged to allow the claim, as made; the master is responsible for loss resulting through his neglect to obtain the necessary documents. A third master says, 23rd December, 1857: "A ship from New Orleans turns out five bales of cotton short of the quantity stated in the bills of lading, which the master signed on seeing the mate's receipts. The magistrates disallowed the deduction from the mate's wages, as gross neglect could not be proved. Answer: "the ship is bound to make good the deficiency, unless it can be proved by evidence from the port of shipment or otherwise, that the missing bales were never shipped. The safest plan is to pay under protest." A fourth master writes, 22nd January, 1858: "In loading a cargo of oil seed cake, I signed for 850 bags, with 10 disputed; 812 were delivered." The editor says, "the ship is liable for the deficiency, subject to the special exception of 10, unless evidence can be produced from the port of shipment that the quantity delivered was the quantity received."

251. DELIVERY. There is no actual delivery, say of a cargo of grain, until it is over the ship's sides; see fast-day and the *Arctic's* case in the article grain.

252. A shipmaster asks, 22nd March 1858: a vessel arrived with a cargo of sleepers, and, as the Customs' regulation is that each day's discharge must be piled on the quay for the officer's supervision and count, before the consignee can draw away any part; can the consignee compel the master to provide men to pile

the sleepers, or is he only bound to put them over the ship's side? The consignee states that they are not delivered to him before being measured and passed by the custom-house, as the charter-party states, 'to be paid so much per load, custom-house calliper measurement.' Answer: "delivery over the ship's side, safely on the quay, is good delivery; and the consignee cannot compel the master to incur the expense of piling the sleepers."

Another master states, 20th December, 1861, "that his vessel has just discharged a cargo of coal from Swansea at a quay at a current rate of freight. On application to the consignee for the freight, a claim is made of 8*d.* $\frac{2}{3}$ ton for the quantity discharged, as being the cost of delivering into store, and refers him to the following clause in the charter-party (in print), which at the time of signing, he did not especially notice, viz:—'And shall deliver the same in regular turn to the order of said freighters, according to bills of lading to be signed for the same, into store, steamer, or the dépôt there, afloat or on shore, the cargo to be there discharged by the ship according to custom, at any quantity by day or night, the merchant may require.' The bill of lading has no reference to the discharge. Such a practice as this is not the custom of the port." The Editor answers: "the ship having expressly covenanted to 'deliver into store,' must perform the covenant at her own expense. Eight pence per ton seems a large charge, and the master ought to have been consulted as to what the men should be paid for the labour. As a general rule the ship is only bound to deliver over the side, but if the master signs to deliver in any other way, the mere fact of his having done so carelessly, or in ignorance, will not relieve him from the stipulations of his contract."

- In April, 1863, the ship *Dantzig*, from Dantzig, discharged at Hull 5,656 pieces of 10-inch by 10-inch sleeper blocks, 535 pieces of 5-inch by 10-inch sleepers, and 14 fathoms of lathwood. This was two pieces more than the quantity stated in the bill of lading. Freight, with £1 gratuity to the master, was paid by the consignee, who subsequently claimed £25 for 66 of the first described sleepers and 18 of the others, short of the bill of lading. This claim was tried in the Admiralty Court before Dr. LUSHINGTON, 26th January, 1864. The action was brought under the 6th section of the Act, 1861. It appears that the consignee had sold the cargo to a railway company, who received it from the ship. In delivering judgment, which went against the consignee with costs, the judge said—"reserving the question of fact, I think the delivery on the quay was a legal delivery. I think so because, beyond doubt, a delivery on the quay was sanctioned, nay required, by the consignee. If the consignee point out a mode of delivery, and that mode of delivery is carried out by the master, the consignee is stopped by his own act from finding fault with the mode of delivery. If once such a delivery is made, the responsibility of the owner of the ship is at an end. It is no part of the duty of the master to provide a watch on shore, his duty is ended by delivery."

253. DEMURRAGE is the allowance made to the ship for detention beyond the stipulated time for receiving or for discharging cargo. A certain number of days are usually stated on the charter-party or bill of lading for this purpose. The freighter can detain the vessel on demurrage the number of days expressed in the charter-party—usually not more than ten, at so much *per diem*. The ordinary form "..... days to be allowed the said merchants for loading at..... and discharging at..... Should the vessel be detained

longer than the said days, demurrage the sum of £..... to be paid day by day for all days so detained," but the merchant not to detain the vessel longer than the ten days. When the stipulated time for demurrage expires, the master should give written notice, through a third party to the freighter. At this stage the owner or master can enter into a special agreement for continuation of demurrage, at increased rate, or if he prefers may consider the charter-party at an end, land the cargo, pay himself for freight and arrears of demurrage, and seek other employment for his vessel. This course ought not to be taken but under legal advice. The master should give notice to the charterer, in writing, immediately his vessel is in discharging berth. Where a ship is detained beyond the number of lay-days specified in the charter-party, the master should give a notice, in writing, of demurrage daily, if possible, including Saturday on Sunday's notice. This recommendation applies both to loading and unloading, Sundays and legal holidays do not count as lay-days when "working-days" are specified, but they count on demurrage. Days are not reckoned from noon to noon. Where a notice is given at ten in the morning of a certain day, that day counts, nevertheless such a "notice day" is seldom insisted on. The consignee or assignee is not liable for demurrage for time consumed at the port of loading, unless by the express terms of the charter-party or bill of lading he is made liable; *SMITH v. SIEVEKING*, Court of Exchequer. If a particular place is fixed on for the discharge of the cargo, or if it is provided that, in the event of certain contingencies, the vessel can discharge at alternative places,—in the former the days run from the ship's arrival at the place fixed on,—and in the latter, from the place selected for commencing to discharge.

254. Subject to any special agreement, three or four consecutive days are considered ample for loading a collier carrying 180 tons. Seven or eight working days, from the time the ship was berthed in her turn and ready for loading, are quite sufficient for 600 tons of coal, and demurrage is claimable for every day beyond. Laying days not being stated, two or three days are sufficient to discharge 60 tons of Bangor slate, and demurrage is due for every day beyond.

255. Masters and others when obtaining charter-party for China, should be very particular about the number of lay-days, as ships nearly always come under **demurrage** there, owing to the want of suitable convenience on shore. This caution is especially necessary when chartering coal in Australia, &c., for China.

256. The litigation arising out of demurrage claims, and the difficulties experienced by shipmasters in securing a lien on cargo

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from the conditions embodied in bills of lading or charter-parties, lead us to refer again to the case on which we lately commented and coupled with others more recently reported. With respect to the *Superior*, before mentioned, we have now the charter-party before us, and can judge more fully of its stipulations. The form is that of the ordinary Danubian charters, and provides that the ship of 689 tons, is to "load, as customary, from the factors of the said freighter, a full and complete cargo of staves and (or) grain, seed, or stowage goods or lawful merchandize, which the said merchant binds himself to ship, not exceeding what she can reasonably stow and carry.* * * The owners to have an absolute lien on the cargo for all freight, dead-freight, demurrage, and average, and the charterer's responsibility to cease on shipment of the cargo, provided it be of sufficient value to cover the freight and charges on arrival at port of discharge." The ship took on board 283,682 staves, the freight on which was £1,155 14s. 9d., but could have carried 91,243 more staves, whose freight would have amounted to £364 19s. 5d. There is no dispute as to the additional quantity the ship could have safely conveyed. On this point there is a common understanding; but the consignee disclaims his liability for dead-freight, and will not admit that the shipowner had a right to stop the cargo for the lien thereby given under charter and bill of lading, on the technical plea, that a merchant who holds a bill of lading, or as consignee, is entitled to delivery of his goods on the ground that the term "dead-freight" is an undisclosed liability. The Court of Exchequer gave judgment against the ship but allowed the case to be taken to the Court of Error.

257. Looking at the question in a practical and business light, we find that a ship of 689 tons was chartered to load a full freight, and that she was not fully laden within the terms of the contract. The agreement stipulated that the charterer's responsibility should end when sufficient cargo was put on board to pay not only the freight but also that which the ship might have earned had she been fully laden. True, the exact amount of freight could not be disclosed on a charter-party, because the ship took staves as a standard, all other shipments to pay "in full and fair proportion." Staves alone were supplied, and it was easy to calculate what quantity of these the vessel could conveniently take in. The shipper of the goods would present the bills of lading for the master's signature, and the parties claiming under those bills of lading would be bound by their contents. As one of the stipulations gave a lien for dead-freight, the captain was justified in not parting with his lien until security was found for ship's charges, or the dead-freight was paid. It is said to be a fact

that the question of the ship's capacity was determined in a few hours by two different authorities. This makes it clear that, if the carrying capacity of the ship could not be disclosed in the charter-party, it might have been inserted in the bills of lading which recited the charter. It was simply the case of a vessel of ascertained tonnage and draught of water, on board of which a partial cargo was shipped, and which was to have been laden "full and complete." Any two independent shipmasters, builders, or surveyors of intelligence, could have settled the claim of dead freight in a few minutes. The charterers hired a vessel of so many cubical feet of internal measurement, and agreed to fill the space; and when the endorsee of the cargo who accepts the liabilities of the charterer and shipper, finds that the goods are stopped for the payment of **dead-freight**, the account of which, as per particulars rendered, is acknowledged, he repudiates that portion of the agreement which bargained for the lien, on the quibble that the condition was void and of no effect, it being, as contended, an "undisclosed liability," which the common law would relieve him from meeting. It was not a question of commercial usage that was urged in defence of the action, but purely a legal technicality. Should the Court of Error affirm the ruling of the Exchequer judges, we do not see what security a shipowner can take for the recovery of dead-freight, if it be held that a lien on the cargo given by charter is not valid. The charterer in this case protected himself by contracting that his liability should end on the cargo being shipped. In many instances it has been proved that the only way of obtaining payment of freight is by the stoppage. When this lien is parted with, the chances of securing the freight are often very slight indeed. Merchants hold bills of lading who may be in an insolvent state on the ship's arrival, and have borrowed largely on the goods, bought them on credit, or sold them and received part or full payment, or taken promissory notes for the same.

258. Another case of demurrage was tried a few days since in the Liverpool Court of Passage. The ship *Bucephalus* was chartered to load a cargo of salt, and, in consequence of non-lading, the vessel came on demurrage. The owners of the ship sued the charterer, who was likewise the shipper, for compensation, and they were non-suited because there was a condition in the charter-party that the charterer's liability should cease when he had delivered cargo alongside the ship.

259. In the Hartlepool County Court a curious case had to be settled by the learned judge, Mr. STAPLYTON. One day's demurrage was allowed for detention of the *Enterprise*. At the foot of the charter-party there were the words in writing "the ship to be laden on or

before the 11th instant," yet in the body of the document there remained, unobliterated, the printed words, "the freighters not to be liable for any delay in the loading." The Court held, in accordance with decisions in superior courts, that writing overruled sentences in print, and the shipowner was thus done justice by.—*Shipping Gazette*, 16th February, 1870.

260. A bill of lading by which goods are made deliverable to the consignees, "they paying for the goods as per charter-party," does not make consignees liable for demurrage incurred at the loading port. If the carrier claims any rights of lien on the cargo for freight, demurrage, or dead-freight, the same must be clearly stated in the bill of lading; and if there is a claim on account of detention beyond the demurrage days, that also should be stated.

261. DENSITY OF THE SEA. Vessels bound from ports on the sea coast, where the water is salt, to ports in rivers where the water is fresh, or to ports in inland seas, like the Baltic, the Black Sea, or Sea of Azof, where the water is only slightly salt, should be careful not to load too deeply, because ships sink deeper in fresh than in sea water. Waters are more or less dense in proportion to the quantity of salts they hold in solution, and, as all floating bodies whatever, displace a quantity of the fluid exactly equal in weight to the weight of the ship or other floating body, it must therefore necessarily follow, that ships with a given cargo will sink deeper and draw more water in rivers and inland seas, than in the ocean; and this is a matter of much consequence, especially as regards large and deep ships. In order that masters may have an eye to the loading and the "draught of water" of their ships and be able to compute how much they may float either lighter or deeper when passing through waters of different densities, we insert here (in addition to the table under the head gravity, specific) the specific gravity and weights of a cubic foot of the waters in which our ships may usually navigate.

Description.	Specific Gravity.	lbs.	Description.	Specific Gravity.	lbs.
River Water...	1,000	62½	North Atlantic	1,028	64½
Sea of Azof...	1,008	63	South Atlantic	1,029	64½
Black Sea	1,014	63½	Arctic Sea.....	1,026	64½
Baltic Sea.....	1,015	63⅞	Mediterranean	1,030	64¾
White Sea.....	1,019	63⅞	Caspian Sea...	1,036	64¾
Yellow Sea ...	1,023	63⅞	Dead Sea	1,211	75¼

262. Now the saltier the water the less will be the draught of water of a ship, other things being equal. Let us suppose that a ship

drew 17 feet water in the London Docks and it was required to be known how much lighter she would float at Malta. We have only to make a simple rule of three statement from the above densities, and work out the result, thus :

As 1,000 oz. : 17 feet : : 1,030 oz. : $16\frac{1}{2}$ feet, solving the work inversely.

The water at Malta being about 1-33rd more dense than the Thames, a ship will not sink so deep at Malta by about 1-33rd of her immersion. A vessel drawing 12 feet at sea will draw 12 feet 2 inches in the floating basin at Bristol, which usually contains a considerable proportion of fresh-water. The same principle is involved in the Thames and in every harbour fed by fresh water. In Newport, Monmouthshire, during neap tides, and after heavy rain, a vessel draws more than on ordinary occasions. After ships have been laden down to their proper draught or "bearing," it requires a considerable weight proportionately to immerse them a few inches more. This extra immersion causes them to become very unwieldy at sea, and much more liable to founder. In engaging a ship for a lump sum, it is usual to have her draught when fully laden specified on the charter-party. In this case it may be necessary for a charterer to recollect the alterations which are occasioned in a ship's immersion by the character of the water in which she floats. When a ship is engaged for a lump sum the owner generally excludes the use of cabin, the sail room, &c., from the use of the charterer. The use of the deck requires special agreement ; see dead freight. Dr. URE states that deep sea-water, from the ocean, from whatever locality, holds nearly the same constituents in solution, containing on an average, in 1,000 parts :

25.0	of chloride of sodium (common salt)
5.3	sulphate of magnesia.
3.5	chloride of magnesium,
0.2	carbonates of lime and magnesia,
0.1	sulphate of lime,

34.1

besides a little sulphate and muriate of potash, iodide of sodium, and bromide of magnesium.

263. DERELICT AND DEVIATION. Any ship deviating from her course to tow a derelict or other vessel in distress is liable to make good to the owners of cargo any loss they may suffer by such deviation, unless the bill of lading gives permission to tow or assist vessels in distress. Deviation without consent also effects the insurance.

264. DERRICK. A contrivance by way of temporary crane, for the purpose of hoisting goods or provisions in or out of a ship.

265. **DHOLL.** The term dholl has three significations ; it is the name given to the beads of carnelians made at Cambay ; it is the Eastern commercial term for a bale or package ; and it is the Indian name for the pigeon pea, which is usually packed in bags containing 160 lbs. each ; large quantities of these are conveyed from Calcutta to Mauritius, Singapore, and China, for the consumption of the abouring classes. The **season of shipment** at Calcutta is after the rains of the south-west monsoon, and usually in the early part of the north-east monsoon ; the bags contain two Calcutta maunds, equal to 164 lbs. Bengal and Madras ton 20 cwt.

266. **DISCHARGING.** When vessels are discharged one end first, the bilge-water may run to the other end and injure goods which may not have sufficient dunnage under them ; see unloading.

267. **DISTANCES BY SEA to Madras and Melbourne, &c.**

	Nautical Miles.	
No. 1.—Plymouth to St. Vincent	2260	
Sierra Leone.....	906	
Cape of Good Hope.....	3582	
Wilson Promontory (Great Circle Com- posite Route), maximum lat. 40½° S. ... }	5971	
Sydney	443	13162
No. 2.—Plymouth to Cape of Good Hope	6748	
Swan River	4672	
Adelaide	1345	
Port Philip ...	505	
Sydney	602	13872
No. 3.—Plymouth to Sydney direct		13280
<i>To India, viâ the Cape of Good Hope :—</i>		
Plymouth to Cape of Good Hope.....	6748	
Mauritius	2271	
Point de Galle (Ceylon)	2084	
Madras	545	
Calcutta	770	12418

DISTANCES—SOUTHAMPTON TO CALCUTTA.

	Viâ SUEZ.	N.M.		Viâ CAPE.	N.M.
To Gibraltar	1172		To Cape	6220	
Malta	988		Mauritius	2271	
Alexandria	815		Galle.....	2084	
Suez	207		Calcutta	1190	
Aden	1310				
Point de Galle	2121				
Calcutta	1190				
TOTAL	7805		TOTAL.....	11765	

	Miles.		Miles.
Aberdeen to—		Liverpool to—	
Banff	72	Dublin	138
Hull	308	Dundalk	145
Inverness	140	Douglas	80
London	510	Wexford	175
Newcastle	175	New York	3016
Bristol to—		London to—	
Cork	260	Alexandria	3975
Dublin	222	Amsterdam	333
Dundee to—		Barbadoes	4374
Hull	277	Batavia	13670
London	483	Bombay	13018
Glasgow to—		Boston, U.S.	3089
Bristol	450	Calcutta	13984
Belfast	135	Cape of Good Hope	7567
Cork	399	Valparaiso	12290
Dublin	223	Madras	13323
Limerick	400	Manilla	15433
Liverpool	243	New York	3324
New York	3200	New Zealand	15341
Sligo	283	Philadelphia	4073
Hull to—		Rio Janeiro	5481
Christiana	670	St. John's, Newfoundland	2569
Hamburg	442	St. Petersburg	1587
London	280	Plymouth to—	
Rotterdam	240	Madeira	1200
Leith to—		Southampton	150
Hull	272	Southampton to—	
Hamburg	550	Håvre	120
Newcastle	136	Cherbourg	100
Stettin	890	New York	3080

268. DRAGONS' BLOOD, a kind of resin forced out of the fruit of the rotang plant, when exposed by the Japanese over the steam of boiling water. The rotang is a species of cane about as thick as a man's arm, which grows to the length of 100 feet. In the East Indies and in the Canary Islands the tree grows to an immense size; at certain times the trunk cracks in various parts and emits a gum which concretes into tears. Dragon's blood is packed at Calcutta in small cases, six of which make a freight ton of 50 cubic feet; it is shipped there all the year round, but chiefly in the north-east monsoons. Bombay 50 cubic feet in cases. A box of Chinese, containing one pecul, measures 7'432.

269. DRUGS AND CHEMICALS. Alkalies, liquid potassæ, liquid ammoniæ (hartshorn), and some other chemical preparations, such as chloride of lime in solution, are sometimes put in corked

vessels ; these substances will destroy the cork (eat it away), and therefore require care. They should, if possible, always have glass stoppers. At Bombay 50 cubic feet of unrated drugs in chests go to a ton ; in some parts 16 cwt.

270. DUNNAGE, a quantity of loose wood, &c., laid in the bottom of a ship, either to raise heavy goods which might make her too stiff, or to keep the cargo sufficiently above the bottom to prevent its being damaged by water, if she leaks. Sometimes it consists of loose articles of merchandise, permitted to be shipped for the convenience of stowing, securing, and filling up cargo. It is customary that all mats, wood, sticks, rattans, &c., necessary for dunnage, stowage, or the preservation of goods, should be free of freight. At Calcutta it is usual for rattans, &c., shipped as broken stowage, to pay a small freight ; the words "to be used as broken stowage" are inserted in the bill of lading. All cargo that is to be used for dunnage should be so stated in the bill of lading.

271. All perishable goods require dunnage ; the quantity for different kinds will, in many cases, be found under their proper headings. The general rule is to have not less than six inches in the bottom and nine in the bilges, and to mat all the way up the sides with cargo in bags. The rule at **Quebec** is for "pot and pearl ashes, tobacco, bark, indigo, madders, gum, &c., whether in casks, cases, or bales, to be dunnaged in the bottom and to the upper part of the bilges, at least nine inches, and two and a half inches at the sides." As the whole of the water in the bilges cannot be removed when the ship careens, even with well-fitted bilge pumps, so the dunnage ought to be always deeper there, and especially in flat-floored ships, some of which require extra dunnage also at the bilges, with cargo in bulk, which naturally settles there when the ship is pressed with sail shortly after loading. The larger the ship taking a full cargo the greater must be the pressure in the lower hold, and hence the necessity for a deeper bed, from the keelson to the second futtock head, particularly with brush-wood and other compressible materials. Speaking of the mode adopted in American ships, Mr. PIERREPOINT, British vice-consul at New York, says "a *full-built* ship requires 6 inches on the floor, 9 in the round of the bilge, 3 inches above and 2 in the 'tween decks. Sharp ships with 15, 20, and 30 inches dead rise, require less on the floor and in the bilges. Three-fifths of all the goods damaged are damaged in the bilges, if not provided with bilge pumps." To judge of the thickness of brush-wood, stand on it and measure from under your feet. In stowing any description of cargo, longers should be kept square, and as level as possible ; it is better

to have considerable breakage than neglect this most important rule.

272. An experienced master strongly recommends that the first layer should be athwart ships and not too close, and it ought to be of a good depth, because the rolling movement is more frequent and at a much greater inclination than the movement fore and aft. If the cross dunnage is too near the skin or ceiling, the wash which may be on it will be impeded as it runs from side to side, and the water will splash against the cargo, which is generally damaged here after severe weather has been experienced. If laid athwartships on the deck (below) the dunnage should stop short one or two inches from the waterways. Another master, chiefly engaged in the Labrador and Newfoundland trade, recommends the longer to be laid fore and aft, not too near each other, in order that the wash shall be restricted to so small a quantity that it will be insufficient to injure the cargo, and it will prevent any body of water from collecting in the wings, and thus damaging it; in this case dunnage athwartships.

273. Referring to **East India cargoes** homeward, Capt. PARISH says: "The dunnage in the hold should be levelled from about two inches above the keelson before the main hatch; and lowered towards the wings, to allow for the droop of the beams. The ground tier should not be carried too far over towards the bilge, where there should never be less than nine inches dunnage from the skin. If the dead-weight consists of cargo in bags, in stowing the third height the dunnage may be reduced to six inches; and above that gradually to two, from the ship's side, which will be sufficient in a tight ship, excepting in the wake of the chain plates and bolts, where it should not be less than three inches.

274. Green or wet wood is totally unsuited for dunnage; it will damage both the cargo and the ship. Although to all appearance dry, wood may after being heated by close confinement in the hold, produce moisture, the evaporation of which will injure some descriptions of goods. Redwood, being heavy is very useful. At Rio Janeiro, if it can be obtained, prefer rosewood to logwood. When sawing logwood do not let the dust remain in the hold, for if wetted it will discolour and damage sugar and other goods. Horn shavings should be avoided at Calcutta, where, and at other Indian ports, horn tips are shipped when better descriptions of dunnage fail. Rattans are frequently purchased by the ship, and are well adapted for the sides. For rosemary see fruit, for piassava see sugar; see also coker nuts, catch, &c. Masters should be cautious when loading some heavy cargoes upon brushwood and fagots, for it happens, occasionally, that the pressure on this sort of dunnage is so great as to squeeze it into

a much smaller space than could at first have been supposed ; so that after getting to sea, ships are sometimes obliged to return to port to unload a part of their cargo, to prevent their foundering. In such cases, firm dunnage should, if possible, be always used. The best dunnage, laid in the best way, will not prevent injury to cargo if the pumps are neglected, either in harbour or at sea ; after lying a long time on one tack, a vessel should bear up, sound the pumps, and, if necessary, clear the hold, and make the pumps suck.

275. In case of dispute on discharging, if the surveyor declares the dunnage not sufficient, the ship is liable for the damage in the bottom, although the surveyor cannot cite any authority as to what would have been sufficient dunnage. Apart from any local or specific regulations, the general rule is that the dunnage must be "sufficient" according to the nature and quality of the cargo. If a ship is not properly dunnaged, the master, unless there are any special circumstances to exonerate him, is liable to his owners for any properly ascertained loss accruing to them through this neglect. Some charter-parties say "to be properly dunnaged by the charterers, and stowed by a regular stevedore." This means that the dunnage is to be supplied by the charterers. The ship is nevertheless liable for any damage for defective dunnage.

276. **Insufficiency.** In the case of the *Grecian*, reported in the *Shipping Gazette*, 8th August, 1855, it was decided at Antrim, that the owner was liable for damage to sugar through insufficient dunnage. The evidence showed there should be 5 to 6 inches to raise the bilges, and 9 inches to raise the other parts of each cask ; she had only 2 or 3 inches.

277. **Guano.** A master asks the *Shipping Gazette*, 11th June, 1856, whether it is necessary on a coasting voyage to have as much dunnage for guano as if coming from Callao, and is answered : the same rule is applicable to coasters as to others, viz., that such dunnage is to be used as shall be proper and sufficient to protect the cargo from damage. When there is any doubt, and the question may arise as to how far the ship is liable, the master should, in all cases, discharge cargo under survey.

278. **Iron Ships.** A Glasgow shipowner asks the editor : "how much if any, dunnage an iron ship should have in her bottom when her floor is raised about 20 inches above the skin, and she has thus an enormous water-space ? Wooden ships require some 8 or 10 inches, but they have not a fourth of the water-space, owing to the timbers filling up nearly all the space between the floor (ceiling) and outside planking. Also, how much in the wings when the ship has a great rise of floor ? Also, if any dunnage is required in the sides, when wooden stringers, 6 inches by 2½ inches, are bolted on to the angle iron, 12 inches apart, to prevent damage to goods, either from chafe or wet ; the space in the sides from the inner part of the stringer to the skin being the depth of the angle iron, say 5 or 6 inches ;" The editor says, 20th May, 1856 : "although it may not be actually necessary to have as much dunnage in an iron ship as in a wooden one, for the reasons assigned by a Glasgow shipowner, yet as usage has adopted an

8-inch depth for a ship, without reference to the shape of her bottom, we fear that in the event of damage to the ground-tier in any description of vessel, whether iron or wood, the parties would have a claim. It might be argued that a leak in the waterways, or stem, or stern-post, above or without the skin or ceiling, would probably cause an accumulation of water above the skin, which, before it could get to the pumps, might injure the ground tier without reference to the space between the bottom and the ceiling. As iron ships are becoming an important feature in our merchant service, and, as they do not generally require the same extent of dunnage as ships built of wood, it would be well if some rule were adopted by owners, shippers, and others concerned, as to the necessary dunnage for iron ships." See the articles iron and iron ships. An owner of iron ships writing 11th October, 1864, to Messrs. LAIRD BROTHERS, Birkenhead, says: "I have made enquiry and find a general feeling amongst all surveyors here that less dunnage is required on board an iron ship than a wooden one, the general opinion being that from a third to a half less is sufficient for an iron ship. This does not, however, settle the question, as in case of damage the underwriters *may* still demand that the old rule for dunnage be adhered to. A movement must be made on the subject."

279. DUNNAGE BATTENS, pieces of oak or fir, about two inches square, nailed athwart the orlop deck of ships-of-war, to prevent wet from damaging the cables, and to admit air; they are also used in sail rooms and magazines, to form a vacant space beneath the sails and powder barrels.

280. EARTHENWARE in bulk should lie on a flat surface—the nearer the bulkhead the better; if on coal, first cover with a plentiful supply of straw. Crates should be either slung or hooked with can-hooks to the twist and not to the bars. All "flat" goods such as dinner plates, dishes, &c., being heavy, are packed in the bottoms of the crates; the light ware and hollow ware on the top. Full-faced crates contain nearly half as much more as flat-faced crates. Their upper parts, shaped like a bow, usually contain light ware and hollow ware. Salt will rot straw used in packing and stowing, and cause breakage; crates, &c., should therefore be kept at a distance from it; water will have nearly the same effect. At Newcastle, when loading earthenware and glass, the shipper usually sends a man into the hold and the master places one in the lighter. In **Staffordshire**, when packing crates, the oaten straw is in bulk, the wheaten in sheaves. The warehousemen there call the latter "piling." Sufficient of it is laid in the bottom of the crate and against the sides to protect the goods from dampness or breakage. That in the bottom is thrust into the interstices closely by the help of an iron shovel called a paddle. A bed of oaten straw is then placed in the bottom to receive the first layer (usually the heaviest goods), which is tightly stuffed with the same, being softer than wheaten straw. A bed of it is also placed

for the reception of every subsequent layer of earthenware, which is closely stuffed like the first to keep the goods from moving, or as it is by some termed "talking" when the crates are in motion. Over the last layer is placed a body of oaten straw, and on that a body of "piling" quite close. The top of the crate is then tightly laced through the upper bars with strong cord singly and across; for foreign packages, a cover of the same material as the crate is nailed on.

SANITARY TUBES (Socket Pipes).

2 feet long, which go to the ton of 20 cwt.

300	2-inch.	81	6-inch.	33	10-inch.
185	3 -	55	7 -	27	12 .
130	4 -	49	8 -	15	15 -
95	5 -	41	9 -	11	18 -

Bends and elbows reckoned same weight as pipes; single junction as 1½-inch pipe; double junction as 2-inch pipes.

Tonnage. 28 crates, small size, weighing 10 tons; 22 crates, mixed sorts or middle size, 9 tons; or 16 crates, large size, 7 tons; will occupy a space of 850 cubic feet or 1 keel. When wheat is 1s. 7d. quarter freight, earthenware per crate is rated at, small, 3s. 5½d.; middle, 4s. 5d.; large, 6s. 0½d.

281. **EBONY**, a black and valuable wood found only in the centre of the tree; the outside, which is white and soft, decays and leaves the black untouched. It grows in Ceylon, the East Indies, and in Madagascar, where it is shipped in large quantities from the French island of Nos Beh or Nossi Bé in French vessels that proceed to Zanzibar to complete with oil, cocoa nuts, &c. It is the best description of dead-weight shipped at Zanzibar, and as the logs are only from six to seven feet long and do not average more than 70 lbs., they are quickly and easily handled and stowed. This ebony is brought from the West Coast of Madagascar, and Passandava Bay direct, in native dhows sent from Zanzibar to trade by barter. Bombay ton 20 cwt., or 50 cubic feet in square logs.

282. **EGGS** may be preserved for many months by steeping them, when fresh, in a dilute solution of sulphate of zinc, 1 part to 20 parts of water; no chemical change takes place within the shell. It is also said that they will keep during a long voyage if stowed in salt perfectly dry, or in fine salt-water sand, the big end down; or in slacked lime, if previously coated with gum; or in oak sawdust, if previously dipped in melted grease, not too warm, or rubbed with it.

Tonnage. &c. Irish eggs for the London, Bristol, and Plymouth markets are packed in cases containing fourteen hundred—every hundred 120; each case measures, on an average, 2 feet 4 inches long, 2 feet wide, and 18 inches deep, making 7 cubic feet. To Liverpool they are generally sent in cases and crates, holding 40, 50, or 60 hundred each; 40 cubic feet to the ton.

283. **ELECTRIC TELEGRAPH CABLE.** Ships strongly built are absolutely necessary ; they will generally take about one-third more than their register tonnage, *n.m.* The cubic space actually occupied varies from 10 to 20 cubic feet per ton of 20 cwt. The first complete cable between England and France was laid in September, 1851, from Dover to Cape Grisnez ; it was 25 miles long, weighed 180 tons, and cost £20,000 ; the other expenses were £55,000. The diameter of the shore end of the Atlantic cable was 1½ inches ; weight per nautical mile (6,087 feet) 8½ tons ; the diameter of the main cable five-eighths of an inch ; weight per nautical mile, in the air 21½ cwt., in sea-water 15 cwt.

These cables are stowed in large circular water-tight iron tanks, built into the vessel ; there are usually three tanks. When the iron ship *Calcutta*, of 2,300 tons with a complete cargo of electric telegraph cable, stowed in water-tight tanks, was run into in the Channel and abandoned by her crew, the tanks floated the vessel, and she was afterwards picked up by a Plymouth pilot-boat, and subsequently by a man-of-war, and taken into Plymouth.

284. In the Court of Common Pleas, Westminster, 20th January, 1864, before Lord Chief Justice ERLE, the SUBMARINE TELEGRAPH Co. brought an action against DICKSON, the owner of a Swedish ship, for casting his anchor off the Kentish coast, fouling plaintiff's cable, and then disentangling it so negligently as to cause damage. The Chief Justice said : " plaintiff had a right to use the bottom of the sea, and defendant to use the surface, and to let go his anchor if the need of navigation required it. The whole essence of the case turned on the word, ' negligence ; ' if due skill and care had been used the cable would not have broken." Judgment for plaintiff.

285. **ELEPHANTS' TEETH** are usually packed in very long barrels ; all those under 20 lbs. are called scrivelloes ; see ivory. Bengal and Madras ton 16 cwt. in bulk, 50 cubic feet in cases ; Bombay 18 cwt. in bundles, 20 cwt. loose, 50 cubic feet in cases.

286. **EMERY STONE**, a hard ore four times heavier than water (4'000) being nearly equal in weight to ordinary iron ore. Emery stone is found with other minerals in large masses ; the best comes from the island of Naxos (called by the Greeks Nicaria) and from other Islands of the Archipelago. It is exported chiefly from Smyrna and Scala Nova whence it is shipped (in bulk) all the year round, but chiefly when freights are low. It is not affected by heat or cold, and is not injured by contact with other goods. Ordinarily emery stone can be obtained at Smyrna for ballast, in which case the freight to England would be say 2s. 6d. $\frac{1}{2}$ ton. Its shipment there is, however, under the control of one firm who own the mines, and

it is said will not sell the article to a master or owner on ship's account; there is in consequence a difficulty in obtaining it unless a vessel is chartered previously. It is frequently used to ballast madder, which see. With measurement goods outwards it might be desirable to take heavy stone ballast, when expecting to load light produce homewards; the chief exports from England are steam-coal and bar and bolt iron. A freight ton of emery stone is 20 cwt.; there is no tare or draft. When Mediterranean wheat is freighted at 1s. 9d. quarter, emery stone is rated at 4s. 8d. $\frac{1}{2}$ ton.

287. ESPARTO is a strong fibrous grass or rush, botanically known as *Stipa tenacissima*, *Machrocloa tenacissima*. In Spain it is called *Esparto*, in Italy *Spartum*, in France *Sparte*, and in Algeria *Alfa*; Latin *Spartum*. Its chemical constituents are as follows:

Yellow colouring matter	12.0	} 26.5
Red ditto	6.0	
Gum and Resin	7.0	
Salts forming the ashes of the Alfa ...	1.5	
Paper Fibres	73.5	
	<hr/> 100.0	

The plant grows wild on both shores of the Mediterranean for about five degrees of longitude; it is found upon arid, rocky soils, having a basis of silica and iron. In a wild state it grows in a tuft or clump, of which such stalks only as have come to maturity and are full of sap, ought to be gathered for exportation. If gathered too green it produces a transparent fibre, with immense waste; if too ripe, the constituent elements of silica and iron are with difficulty removed. It should be gathered by hand and left to dry for a week or ten days before being removed for packing. From the green to the dry state it loses 40 $\frac{1}{2}$ cent. of its weight; when shipped in loose bundles great space is required for stowage. When placed under a hydraulic machine the bulk is reduced one half; the bales which are secured with iron hoops, weigh about 2 $\frac{1}{2}$ cwt. each; 10 bales say 1 $\frac{1}{2}$ tons. By this mode the fibre is kept clean, and can be more easily stowed. Of the 33,475 tons imported in 1864, barely 3,000 tons were in hydraulic-pressed packed bales. They came from the ports of Oran and Arzew; of these a vessel can take two-thirds of her registered tonnage. If the ballast or ore is damp, and the esparto continues some time in contact, the exterior of the lower bales will be discoloured and become mildewed. If in a confined place, salt-water will spot esparto and turn it black; practically no injurious effect is produced, but buyers prefer clean dry esparto. Fresh-water will have much

the same effect. Loading and discharging in wet weather should be avoided if possible; rain will not affect it much if stored in a well-aired warehouse; when wetted, loose grass is liable to become heated. A fire which occurred in the Tyne dock, Shields, 28th May, 1865, is supposed to have originated in this way. It is liable to spontaneous combustion.

288. The plant is particularly abundant in several of the sea board provinces of Algeria. April, May, and June are the proper months for the harvest in Africa, and the principal places of shipment thence are Arzew, Oran, and Mostaghanem; Arzew is the chief port and has the best bay. After the harvest some of the grass is stored to wait for shipment.

289. The **harvest** in the south of Spain is the same as in Africa; when the grass has not been gathered previously, a late crop can be gathered about September. In Spain it is used for mats, shoes, and rough purposes, and as food for the bulls, which, roaming about the wilds of the country, are subsequently exhibited at the bull fights. Cables made of it are excellent; from their lightness they float on the surface, and are less liable than hempen cables to be injured by a foul bottom; they are used extensively in the Spanish navy. The principal ports or places of shipment of esparto are Alicante, Carthagena, Almazaron, Aguilas, Garrucha, Carboneras, Las Negras, Agua Amarga, San José, Almeria, and Roquetas. Lead or sulphuric ores (pyrites) can be obtained at Carthagena or Almeria.

290. In 1859, esparto was practically unknown as freight to England, whereas the importation for the first eight months of 1864 (January to August), was 33,475 tons, valued in £142,840 at £4 5s. 9d ton at the port of shipment; say £5 10s. to £6 delivered. One extensive importer at Newcastle received in 1856 about 200 tons, and in 1864 over 30,000 tons. The principal place of import is Newcastle-on-Tyne, which in 1864 received five-sixths of the imports of the United Kingdom. Some few cargoes go to Wales, to Scotland, to Liverpool, and London. Many patents have been taken out in England for converting esparto, by a strong chymical process, into pulp or half-stuff, as a substitute for rags in the manufacture of paper; a few tons are made up into rush mats.

291. The barque *Restorff Rosenhagen*, Capt. KORFF, of Rostock, 265 tons register English, 94 feet long, 27 broad, and 14½ deep, loaded Spanish grass at Alicante in February, 1864. She had 100 tons of ballast, sand, and small stones, and 135 tons of grass, two-thirds in bundles, say 100 to 110 lbs. each; the remainder loose. Her hold was full. She is a good carrying ship, and so laden drew

10½ feet aft, and 9½ forward ; with 400 tons of Cardiff steam-coal she draws 13½ feet aft and 12 forward. The grass is shipped at Alicante all the year round.

292. The following details may enable a master to judge of the stowage of esparto ; each of the six vessels had some ballast. They took rather more than two-thirds of their register tonnage ; those which carried deck loads took five-sixths. It is usual to pay two-thirds freight for deck load.

Vessel.	Tons reg.	Bales in hold.	Tons.	Bales on deck.	Tons.	Total bales.	Tons loose.	Total tons.	Port of Destination.
GARIBALDI	175	754	106	147	21	911	9	136	Liverpool.
ROYAL CHARLIE	192	830	116	206	29	1036	17	162	Liverpool.
ST. JEAN	210	900	126	216	30	1116	7	163	Rotterdam.
BRILLIANT	270	1199	168	none	none	1119	19	187	Hull.
STERNA	300	1352	189	230	32	1582	6	227	Leith.
HEBE	600	2831	396	269	38	3100	none	434	London.

The above cargoes were shipped at Arzew, which as previously, stated, is a fine roadstead ; vessels of the largest tonnage, including H.M.S. *Himalaya*, have been at anchor there. The six vessels were loaded between May and December ; the time occupied depends much on the state of the weather ; there is no quay, and the cargo has to be carried off by skiff or boat at shipper's expense ; in dry weather 30 tons of esparto may be taken off ; in wet weather next to nothing. Grass can be shipped all the year round. There are **no port charges** at Arzew, and a pilot is seldom required. Oran is more exposed, but Mers el Kebir, close to Oran, being in the same bay, is deep and safe.

293. An importer writing 19th November, 1864, says "the quantity of esparto imported at Newcastle, in *bales*, is exceedingly small. A portion of one cargo only was in bales. For the first six months of 1864 there were 114 ships of the aggregate tonnage of 43,348 registered tons, and they delivered 20,546 tons of esparto. Four or five of these were not quite full, and received dead-freight on say from 100 to 150 tons, which, added to the quantity actually delivered, would make 20,700 tons, or within half of the registered tonnage." Of the 114 vessels there were from Carthagenas 32, Alicante 23, Almeria 22, Aguilas 21, Garrucha 7, Carboneras 6, Malaga 2, and Las Negras 1. Those from Alicante were of much less tonnage than those from the other ports ; and a large proportion of them were foreign, and generally with ballast. The **port charges** on the coast of Spain vary very much. Alicante is perhaps the most

expensive port, and Almeria next. The port charges, consular fees, stowage, mooring, &c., will amount to from 15 to 20 P cent. on the gross freight, but this may not be all chargeable to esparto, as the ship, if in ballast, would have a portion of these charges to pay. The following six vessels were loaded during the summer of 1864; they all had lead as dead-weight, the freight of which varied from nothing to 7s. 6d. P ton.

Vessel.	Tons. reg.	Grass tons.	Port of loading.
MARY GILLESPIE...	228	112	Carthageria.
MINDEN.....	321	154	Aguilas.
EDINA.....	456	210	Carthageria.
THAMES	488	271	Ditto.
TYNEMOUTH.....	545	251	Ditto.
BOMARSUND	516	276	Ditto.

294. **Spontaneous combustion.** The barque *Castle Lachlan*, Capt. C. WHITE, belonging to Mr. T. SUTTON, of North Shields, took in at Agasteria (Greece) 270 tons lead, and left 18th September, 1868, for Aguilas, where she filled up with 257 tons of loose esparto grass, and left 30th October for Shields. On the 9th of November, five miles off Lagos, which is 15 miles to the eastward of Cape St. Vincent, smoke was observed, and on taking off the hatches at 6 a.m., great quantities poured up; they were closed again immediately and the tarpaulin put on; when the boats were got out the hatches were again opened, and then the flames burst up with great force. At 7 a.m. the foremast fell over the side, being burnt through under the deck; at 7.30 the sails and rigging were destroyed; and at 10.30 the main and mizen masts fell; at 4 p.m., the ship being burnt within three or four feet of the water's edge, the crew went on board the schooner *Siren*, of Yarmouth, Capt. BEAVER, from Leith, where they remained until 9 a.m. on the 10th, being then transferred to the Spanish steamer *Alicante*, from Cadiz for Corunna, where they were landed on the 13th. Some of the crew attributed the fire to the movements of the ship at sea, which caused a friction of the grass in the hold, and they considered that there was some mineral substance in the grass which aided the friction, but Capt. WHITE thinks that the fire was generated by the dampness of the grass when shipped. At Aguilas it is stacked in the yards in piles, and if the esparto is gathered in rainy weather, the bundles in the centre of the pile and in the bottom, being at a distance from the air, become mildewed, and turn black. The barque *Rebecca*, of Shields, after being laden

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at Aguilas in the spring of 1868, took fire at sea and was totally consumed. The *Castle Lachlan* registered 434 tons, and was 113.6 feet long, 29.1 broad, and 20.7 feet deep. The lead was stowed grating-fashion, and the grass, 257 tons, on it. The bundles were thrown loosely into the hold and pressed only by the men's feet. It filled the hold and there was no appearance of greenness or dampness. Capt. WHITE considers that the bales are better pressed in Oran, being placed under a pressure of 300 tons, than in Aguilas, where, however, they are better pressed than in other parts of Spain. The grass at Aguilas, being larger and longer, is better than in any other part of Spain. Mr. EMELIE INSHELWOOD, was in 1868 the only exporter from Arzew and Oran.

295. In the Court of Exchequer, 20th January, 1864, before Baron BRAMWELL, SULLY sued for £50 9s. 9d. freight from NOBLE, who paid £20 10s. into court. In October, 1862, defendant chartered a ship at 15s. $\frac{1}{2}$ ton, to load a cargo of esparto in Spain. On her return to Newport there was much unoccupied space in the hold, and it was a question whether this arose from shrinkage or deficiency in the amount received. The master stated that he had done all he could to induce defendant's agent to put more than 151 tons on board, and that he had only sailed with a short cargo because he could procure no more. The Spanish agent stated that he had offered to fill up on the following day, the space left, which was sufficient for 40 or 50 tons. The jury assessed the damage at 40s. beyond the amount paid in. A rule for a new trial was refused.

296. The *Eurus*, Capt. BELL, of South Shields, left Carthagena with a cargo of lead and esparto early in July, 1866, for the Tyne. On the 14th of July, at six p.m. almost instantaneously a fire broke out under the fore-castle deck. The crew immediately poured water down the fore hatch and round the foremast; but the heat and smoke increased so much that it was with difficulty they kept their post. This continued until ten p.m., when a foreign barque was sighted and was asked for assistance, but was unable to render any, excepting to remain by the burning vessel for the night. The crew kept pouring down water until daylight, when a course was steered for St. Ubes, off which, at two p.m. on the 15th, she was boarded by a pilot, who ran the vessel as near St. Ubes as possible; on getting into three fathoms, it being then high tide, the anchor was let go, and the ship was scuttled, the fire at the time raging furiously in all parts.

297. FAST DAY. In the Boston (U.S.) Circuit Court, 1st July, 1857, *S. F. Co. v. TANGIER*.

This was a libel to recover the value of cotton accidentally burnt on a wharf on a fast day. Mere discharge is not a delivery; unloading is one thing, delivery another. The goods must be placed so that the consignee can find them and ascertain their condition. Readiness to deliver, and a proper notice to the consignee, may often place them at his risk. The readiness must be at a fit time, and the notice a proper one; and if notice be given, and attended to by the consignee, and the ship is not ready to deliver at the time, new notice must be given. Notice to deliver on Sunday is no notice. The evidence covering 30 years, shows that a fast-day is not a day of delivery. The master may, at his own risk, put

out goods on a fast-day; but there is no delivery till the next working day. It has been said that a fast-day is a holiday, rather than a religious one; so is the 4th of July. Here the goods were at the risk of the ship, unless by Act of Congress relieved. Decree of District Court (Judge WARE) reversed; judgment for value of cotton and costs.

298. FEATHERS. Russian feathers require one-third more space for stowage than hemp, which see. The Baltic rate of freight for feathers is the same as codilla hemp per ton of 44 poods gross. A bale weighs 1 cwt., a last 17 cwt. In some places 1,700 lbs. form a last.

299. FELT. Court of Exchequer, 16th December, 1861, before Mr. Baron WILDE, *ACRAMAN v. ENGERT*. This was an action to recover back the sum of £350 paid for some felt. Plaintiff shipped a quantity manufactured for him by defendants on board the *Criterion*, bound for Australia. When she was at sea, some of the bales which had been packed by defendants, were discovered day by day to have ignited through spontaneous combustion, and were consequently thrown overboard. It was proved by witnesses that bales of inodorous bitumen felt were of a very combustible character; they were the first to take fire in this instance. The question, which was ultimately left for the consideration of the special jury, was, whether the felt so manufactured by defendants was reasonably fit for the purposes of exportation. The jury returned a verdict for defendants. The *Lord of the Isles*, Capt. DAVIES, from Greenock, for Hong Kong, took fire 24th July, 1862, in lat. $12^{\circ} 13' N.$, lon. $115^{\circ} 50' E.$, in consequence, it is supposed, of "spontaneous combustion of some bales of felt placed in juxtaposition with bundles of railroad iron in the lower hold." The crew and passengers, thirty in all, arrived in their boats at Macao, after being twice boarded by pirates.

300. FERMENTATION is the result of chemical action in its incipient state. It is somewhat analagous to combustion, and is not unfrequently the preliminary stage of it. It is produced by the reaction of certain substances, principally animal and vegetable, on each other, under the influence of heat and moisture together. Heat alone is not sufficient for the production of fermentation; air, in small quantities, and moisture, must also be present at the same time. There are various sorts of fermentation, such as the vinous, acetous, and putrefactive. The *vinous* is where saccharine matter is converted into alcohol or spirit, as in the production of beer by the fermentation of wort obtained from malt, or that of wine from must—the extract of the grape. The *acetous* is a further development of the vinous, resulting in the production of acetic acid or vinegar.

Putrefactive fermentation is more commonly developed in animal substances or in those vegetable bodies whose composition more nearly resembles that of animals. Fruit, especially that which is very juicy, such as oranges and lemons, wheat, hemp and flax, hay and straw, dry fish, hides, &c., require special attention, to prevent injury by the development of fermentation. The measures to be adopted are indicated by a consideration of the circumstances above noticed, as affecting fermentation. As the most effective means are dependent on ventilation, see that article. It is important that a master should well observe the condition of the cargo in course of shipment, as in case of damage from fermentation it may be of the utmost importance to be able to decide whether the damage has arisen from the effects of defective condition at the time of shipment, or from any injurious circumstances occurring subsequent to it. It will be well also to note that manufactured goods, such as silk, linens, &c., which have received damage from fermentation, are not always to be considered as having been affected by defective arrangements on board ship, for not unfrequently such goods receive damage through bad preparation, such as the employment of improper sizing, or the want of proper cleansing in the final dressing ; see silk.

301. FIRE. It has been suggested as very probable that when vessels are becalmed in tropical climates, they may be set on fire by the deck lights, should the focus happen to fall on some easily-ignited substance below. It is said that by placing in the bottom of the hold, a cask of common chalk connected with the deck by a pipe, a fire below can be quickly extinguished by pouring down two gallons of sulphuric acid, to be kept in a bottle or jar for this duty : a sufficient quantity of dense smoke will thus be produced to put out any fire. A fire broke out in October, 1866, in the cellars of a druggist named ARUSTIAN, in the Avenue Montagne, Paris, and was brought to a termination in a singular manner. A boy had let a lighted lucifer match fall on some rags, which became ignited, and the flame spread to some bottles and carboys containing various kinds of spirits and alcohol. These soon burst and flooded the cellar with a blazing liquid, which emitted a smoke so suffocating that the firemen were unable to enter. Suddenly a loud explosion was heard, and the flames became extinguished as if by enchantment. Three bottles of sulphuric ether, containing in all about three quarts, had burst, and the vapour, mixing with the atmosphere, had put an end to the combustion. Flame cannot exist in carbonic acid gas ; see the article combustion (spontaneous), and the article gold. The penalty for melting pitch, tar, grease, or any inflammable substance on board

ship in the Phillippine Islands is 25 piastres = £5 8s. 4d. In Charles-town, S.C., smoking cigars or pipes is prohibited by law in all the wharves and streets leading to the same, east of Bay-street. Similar penalties are levied in many ports.

302. Capt SEDGWICK recommends that when fire occurs in the hold, a recorded number of augur holes should be bored in the gun-room or forecastle until the water is level with the beams ; one hatch only to be kept open, two will admit a draft and create a flame ; throw in water daily. When the danger is over plug all the holes. If bad weather prevails, close every aperture, as a fire may be thus kept smouldering for weeks. Another plan is to bore holes in the deck, over the suspected place, nearly through ; plug the scuppers, &c., and fill the deck six or eight inches with water. Then finish the holes, and keep them supplied with water, plug them immediately the supply fails or the danger is over. In all cases prepare boats with provisions.

303. By the Queen's Regulations 1862, captains in the Royal Navy are instructed to take every precaution for the security of the ship against fire, and to establish general regulations for the duties to be performed by the officers and men, should a fire occur, either during action or otherwise. A captain is not to allow lights to be used in the orlop, or cable tiers, or store-rooms, except in good lanterns, nor candles to be stuck against the beams or sides, in the holds, or other parts of the ship ; nor lights to be kept in the officers' cabins, except at seasonable hours and on proper occasions ; nor phosphorous, nor any other substance or liquid susceptible of spontaneous ignition, to be on board in the private possession of any one. He is to direct the carpenter to be careful that the lead or copper sheathing of the holes through which the funnels pass, be kept in perfect repair. When dockyard or other artificers are employed on board, he is to take care that all the lights in those parts of the ship in which they might have been used by them are extinguished before they quit their work, and he is to cause an officer to go round, who is to report to the commanding officer that this has been done. He is, moreover, enjoined never, on any account or pretence, to allow spirituous liquors, varnishes, or other inflammable stores of whatsoever kind or description, to be drawn off or moved from any cask, vessel or package in which they may be contained, anywhere but on the upper or main deck by daylight ; but should any occasion make it essentially necessary to draw off or move spirits, or any inflammable stores, on the upper or main deck by night, he is to take care that such lights as it may be requisite to use be in DAVY's Safety

Lamps, and kept as far from the spirits or stores as possible ; and no other lights, except those in DAVY'S Lamps are ever to be used in the holds in which inflammable stores are kept. When a spirit cask is emptied a quantity of salt water is immediately to be poured into it. No lights whatever are to be used in the spirit rooms of Her Majesty's ships.

304. Lieut. A. RODNEY BLANE, commanding the dispatch vessel *Psyche*, 2 guns, writes at Marseilles, 16th December, 1865,—“yesterday afternoon, about three o'clock, the steward detected the smell of fire, and came into the saloon first, as there had been a fire in the stove ; but, finding nothing wrong with that, he looked around and discovered one of the curtains that was drawn over a ‘bull’s-eye’ scuttle smouldering, and all but in a blaze, from the rays of the sun striking through the glass. Two holes are burnt quite through.”

305. FIREARMS. Capt. PARISH, recommends that after firing, the barrels of muskets and pistols are to be washed out with hot water, and plugs of tow driven up and down to wipe them thoroughly. The best method to preserve the locks and barrels from rust after thus cleaning them, is to have them wiped frequently with a rag dipped in sweet oil.

306. FIRE-CRACKERS. Half-boxes Chinese measure 3'327 ft.

307. FISH. Charter for dry fish by quantity and not by weight, as the state of the atmosphere greatly alters the weight ; for herrings, Labrador fish, pilchards, &c., see the several headings. Anchovies are caught on the coasts of Catalonia in May, June, and July. Fresh fish may be legally landed on Sundays ; see landing.

FISH MEASURES.

Anchovies, barrel ...16 to	30 lbs.	Herrings, a measure	600 fish.
Cod fish, quintal.....	112 lbs.	„ a cade	500 do.
„ a last	12 bar.	Pilchards, barrel	41½ gal.
Herrings, white, a last ...	12 bar.	„ hhd., about	3,000 fish.
„ barrel	26½ gal.	Sprats, a cade, about	1,000 do.
„ cran	37½ do.	Salmon, a box	120 to 130 lbs.
Fish, a stone	14 lbs.	Sturgeons, a keg ...	4 to 5 gal.

Tonnage. In Newfoundland, &c., 20 quintals of dry fish ; 8 barrels or 6 tierces pickled fish ; 340 Labrador herrings 1 barrel ; 12 barrels (flour barrels) dry caplins go to a ton. At New York, 6 barrels pickled fish, 16 cwt. dried cod fish in bulk, 12 cwt. in casks of any size ; at Baltimore, 7 barrels pickled fish. At Seville, 22 quintals fish go to a ton.

Foreign packages. At Cephalonia a barile is 67'244 lbs. ; at Leghorn, 74'850 lbs. ; Maryland barrel 226 lbs. ; United States 200 lbs. In New Brunswick a drum of pressed cod fish is 128 lbs. = a Portuguese quintal.

308. **FLAX** is the produce of a beautiful grass-like annual plant with slender stalks, small leaves, and blue blossoms. Great variation is caused by climate and culture. In hot countries flax is of very little value for its fibre, but it produces so abundantly of seed as to be highly profitable to the grower, because the seed furnishes one of the most important of the oils; none other is found to be of so much value for mixing the colours of the artist and the house painter. In cold countries, on the contrary, the seed is produced more sparingly, and the fibre is strong and of great value. Much depends on its cultivation, for if thinly sown it grows robust and the fibre is coarse, but if sown thickly it runs up and is delicate from want of a proper circulation of air through the plants, and the fibre becomes fine, soft, and silky, qualities which for some purposes are very highly prized. A full cargo will require more than half the ordinary ballast; stone is suitable. A ship of 350 tons, which took equal to 300 tons clean hemp, required 100 tons of ballast. Dunnage, bottom 9 inches, 14 to the upper part of the bilges, $2\frac{1}{4}$ at the sides; for stowage, see hemp, cotton, &c. When oil or tar has been spilt on flax, it is very liable to spontaneous combustion on the introduction of moisture. New Zealand flax, which is generally taken at double freight, is said to be liable to ignition when wetted either with water or oil; see cotton.

Tonnage. At St. Petersburg 16 bobbins of 12-head flax or 63 poods are reckoned to a ton, 47 bobbins of 6-head or 63 poods to a ton. At Riga, six ship-pounds, 330 lbs. each, make a ton. At Archangel, 2 tons of clean flax are equal to one ton of codilla and tow, and receive the same freight. The Baltic rates of freight for flax is in all cases the same as hemp. The E. I. Co. rates 50 cubic feet sunn flax to a ton.

Freight. When Mediterranean wheat is freighted at 1s. $\frac{7}{8}$ qr., clean flax is rated at 10s. 6d. $\frac{7}{8}$ ton of 20 cwt. Flax or hemp, half-clean, pays 15 $\frac{7}{8}$ cent. more than clean; out-shot one-eighth; and codilla one-half more than clean hemp. A Russian bale 5 or 6 cwt.; 12-head bobbins 126 lbs.; pood 36 lbs. English, or 40 lbs. Russian. Dutch matt 126 lbs. Flemish bale 254 lbs. Bremerhaven stone 20 lbs. German rahmel or bundle 20 lbs. A last 17 cwt.; in some places 1,700 lbs.

309. **FLOUR** requires same dunnage as flax, and is allowed to stow six heights of barrels; see general cargo. American ship-owners, in the stowage of mixed cargoes in large ships, have, through experience, discovered what "pressure" flour barrels, provision casks, &c., will bear, and so avoid reclamations for damage if otherwise properly stowed; hence in large ships, above 600 tons, with dimensions exceeding in length $4\frac{1}{2}$ times the beam, and 21 feet depth of hold, orlop decks will come into general use so as to relieve the pressure by dividing the hold, like a warehouse, into stories. The large ship *Liverpool*, which left New York in 1854, with an entire

cargo of flour, was never heard of after; it is supposed the lower tiers of barrels gave away, and that the cargo having got loose, shifted in a gale of wind, and capsized the vessel. Flower, if stowed near, will readily imbibe the scent from oranges and lemons; this scent will go off in a great degree, when the flour is exposed to dry air; the scent from coal tar, Stockholm tar, varnish, &c., will not go off; contact with shumac will injure flour. For ship's use sacks of flour are sometimes stowed *over* casks of water; see grain. At Montreal the stevedore's charges for stowing flour for a ship of say 500 tons register is about \$35.

310. The barque *Echo*, of Plymouth, 369 tons, Captain W. W. STEVENS, having been chartered by Messrs. WILLIAMSON, BALFOUR, and Co., at Valparaiso, to carry a cargo of wheat and flour in bags to Cape Town, Table Bay, proceeded to Tomé, Conception Bay, September, 1868, taking with her the sacks required. On the 8th October, 1868, she left with a full and complete cargo, consigned to Messrs. JAS. SEARIGHT and Co., which consisted of

	lbs.
FLOUR—5,720 quintals (each 101½ lbs.)	580,580
WHEAT—2,408 sacks, 3140 hectolitres (each hecto- litre 168 lbs.)	533,701

Tons 497½½ = 1,114,281

At £3 7 ton, £1,492 6s. 9d. Less commission; see charter party.

The dimensions of the *Echo*, are 129 × 26·7 × 17 feet. With this cargo, and her stores, water, &c., for six months, she drew forward 14 feet 5 inches, aft 16 feet 6 inches, with a dry side amidships of 4 feet 2 inches (same being LLOYD'S marks), in which trim she answered well in all weathers. Having been 54 days on the passage and encountered strong westerly gales off the Coast of South America, she arrived at Cape Town, 1st December, and as the consignees accepted the cargo as per bill of lading, none of the grain was weighed there. Eight working days were employed loading and about the same discharging—the cargo being lightered in both cases, and as per charter-party, at risk of merchants. [The dock at the Cape is now open, and vessels will most likely discharge in it for the future.] This cargo was stowed as follows: the hold having been thoroughly dunnaged as customary, flour was placed on the bottom, sides, and ends, around the chain lockers and pumps, also on top under the beams, except in the main hatchway. The grain was stowed in two blocks; one-third in the body of the after hold, completely covered with flour; the other two-thirds in the body of the main hold, well aft, also covered on all sides, excepting in the main

hatchway, into which it was carried chock up to support the hatches, &c. The bags of flour forward were built to form a bulkhead, commencing under the fore peak and sloping, say at an angle of 45 degrees, upwards towards the fore hatch. In the fore and after hatches, spaces were left for stowing sacks of grain, to be passed out of the main hatch if required to trim the ship, or to ease the strain should the grain become heated and swollen. The *Echo* was going a winter voyage, and if the main hatch had been broken in by a sea, a casualty which has frequently happened to grain vessels deeply loaded, these precautions might have been of some service. The grain being heavier than the flour, was stowed near the centre and the body of it sufficiently high up to make the ship easy in a sea-way. When the cargo was delivered at Cape Town the wheat was uninjured, and although many bags of flour were rendered more or less unsaleable without re-packing, through being stained and skin damaged, yet the amount of damage was nothing compared with what it would have been had they contained wheat, which imbibes leakage more freely. Since the construction of the fine floating docks at Table Bay, very few vessels load or discharge in the Bay, so that very little lighterage is required.

311. A barque 483 tons register, which stowed 750 tons of sugar and oil, took in at **Valparaiso** 12,000 bags of flour, say 600 tons, and 1,000 bags of bran, say 40 lbs. ϕ bag. This cargo filled the hold chock up, but there was open space left in the 'tween decks, which were 6 feet 6 inches high, to allow a man to crawl about on his hands and knees. As she had considerable depth of hold the cargo made her crank, and at sea she lurched fearfully. The dunnage consisted of bamboo, 14 inches, compressed to 10, bran next the dunnage. Flour bags (calico) contained 50, 100, and 200 lbs. each; 2,000 lbs. to the ton. Much attention must be paid to the condition of the flour, as when wetted and caked ashore, the bags are often beaten with sticks before delivery, to give their contents an appearance of freshness. Deck leakage, so injurious to flour cargoes, is liable to be increased at Valparaiso, by the heavy rollers to which a vessel is exposed while loading.

FORM OF CHARTER-PARTY.

This Charter-party of affreightment made, indented, and concluded in VALPARAISO, this thirty-first day of July, eighteen hundred and sixty-eight, between Messrs. WILLIAMSON, BALFOUR, & Co., Valparaiso, charterers, of the one part, and WILLIAM W. STEVENS, master, and acting as agent for the owners of the good vessel called the *Echo*, A. 12 years, of Plymouth, being 369 tons per register or thereabouts, and now lying at anchor in this bay, of the other part, WITNESSETH :

1. That the said ship or vessel being tight, staunch, and strong, well and sufficiently manned, stored and victualled, and in every respect fit to perform the voyage, hereinafter mentioned, shall, after discharge of her present inward cargo, proceed to the port of Tomé, and there load a full and complete cargo of wheat and flour in bags, not exceeding five hundred and twenty tons in all, not exceeding what she can reasonably stow and carry over and above her cabin tackle, provisions, and furniture.

2. The cargo to be placed by the shippers alongside the ship and to be received on board as fast as sent alongside.

3. For the loading of the said cargo, twenty working lay-days shall be allowed to be reckoned from the day the vessel is ready to receive cargo at Tomé to the day of her despatch, and ten running days on demurrage, at the rate of eight pounds sterling per day, to be paid daily for each and every day's detention. Time occupied in shifting ports not to count as lay-days.

4. The vessel to be consigned in the port of Tomé to charterers' agents, who will transact her business for the sum of twenty-five dollars.

5. The master to give notice in writing when he is ready to receive or deliver cargo; and charterers' agent to inform him, in like manner, when he is at liberty to proceed on his voyage. Bills of lading to be signed by the master, "weight and quality unknown, all on board to be delivered;" at any rate of freight without prejudice to the charter-party.

6. The necessary dunnage and mats to be found by the vessel, but should charterers require different parcels of produce to be separated for other purposes than the prevention of damage, they are to find the materials. It is hereby specially agreed that the vessel shall be carefully dunnaged to the satisfaction of the charterers or their agents.

7. Should the vessel put into any port in distress she shall consign to charterers' agents.

8. The vessel to be consigned in port of discharge to charterers' agents, who will transact the vessel's inward business, and charge for same a commission of one per cent. on the gross amount of freight earned under this charter.

9. After receiving on board the said cargo, stowing it in the customary manner, and being cleared out at the Custom-house, the said vessel shall therewith proceed to Cape Town, Cape of Good Hope, where orders shall be given her within forty-eight hours after arrival, to discharge there or to proceed on to Algoa Bay to discharge, or as near thereunto as she may safely get, and deliver the same with all possible dispatch, and in conformity with the established customs of the port. The act of GOD, restraints of princes and rulers, fire, pirates and enemies, the dangers of seas and navigation, &c., during the said voyage, always mutually excepted. Charterers having the privilege of naming the dock of discharge, provided they do so within 12 hours after arrival is notified them. In consideration of all which, the parties of the first part do hereby agree to pay or cause to be paid, to the parties of the second part, for freight of the said vessel, on a true and right delivery of the cargo in the port of discharge, according to the bills of lading and charter-party, at and after the rate of three pounds sterling if discharged at Cape Town, and three pounds five shillings sterling if sent on to Algoa Bay, for each and every ton of two thousand two hundred and forty pounds avoirdupois gross weight, delivered, payable one-third in cash on arrival of the vessel, and the remainder on right and true delivery of the cargo in good and approved bills on London at three months' date, or in cash less discount at the rate of five

per cent. per annum at master's option. And for the true and punctual fulfilment of each and all the conditions herein mentioned, the contracting parties do hereby bind themselves to each other, in the penal sum of the estimated amount of freight, to be forfeited and paid, by the party delinquent to the one observant.

In witness whereof, we have hereunto signed our names at the time and place before-mentioned to seven copies.

Witness : H. J. BUCKLEY.

Witness :

WILLIAMSON, BALFOUR, & Co.

WILLIAM WILLIAM STEVENS.

312. Taking the average weight of good wheat at 48 to 60 lbs. $\frac{p}{b}$ bushel, the average yield of flour would be fully 12 $\frac{1}{2}$ lbs. for every 14 lbs. The weight of the straw is about double that of the grain. Table of the produce of one quarter of wheat (= 504 lbs.) by Mr. HARD.

Flour	392 lbs.
Biscuit or fine middlings	10
Toppings or specks	8
Best pollard, Turkey <i>p.</i> , or twenty-penny	15
Fine pollard	18
Bran and coarse pollard	50
Loss by evaporation and waste ...	11
Total	504

313. **Turpentine.** In April, 1856, an action was brought in the Queen's Bench, under 15 and 16 Vic., cap. 16, sec. 46, against the *Star of the West*, which shipped at New York 2,150 barrels flour, 600 bales of cotton, 800 tierces lard, 100 hogsheads tallow, 520 barrels spirits of turpentine, 57 puncheons turpentine, 3,600 barrels tar, &c. The exporters of flour were not forewarned that turpentine would be shipped. On delivery the flour was tainted by turpentine, although stowed at a distance from it. Lord CAMPBELL pronounced the owner liable; see extended report in the article responsibility.

314. **Country damaged.** A Liverpool broker writes to the *Shipping Gazette* 21st January, 1861: "The Norwegian brig *Atalanta* shipped a cargo of wheat and flour at Bordeaux in November, and arrived after a stormy passage, and was discharged under the inspection of the underwriter's surveyor, who found it properly stowed and dunnaged. A small quantity of grain and flour was damaged by seawater, but as the master furnished the receivers with the surveyor's certificate and offered to extend his protest, no claim was made on that account. The receivers of the flour, however, made a claim for £27 10s. 6d., or 1s. 6d. each for 367 bags, which they said were country damaged, and sued the master in the County Court. The evidence for plaintiff was a respectable corn broker who examined the flour and considered it had been wet previous to shipment, and had been allowed to dry and harden in the sacks, by which means it had deteriorated 1s. to 1s. 6d. $\frac{p}{b}$ bag. The master affirmed that the flour came alongside in barges, that he personally superintended the loading, and saw every bag put on board. The flour was or appeared to be in good order, as far as he could observe without examining the contents of the bags. There was one exception; a bag handed from the barge was torn and was sent ashore on that account, but the flour in it appeared to be in good condition and uninjured. While loading the weather was fine. The judge took several days to consider his verdict. By his decision it appears that the master should examine the interior of every package received on

board, and also thoroughly understand the quality of each article. It is contended that flour made from insufficiently dried or damaged wheat, will, in a short time, cake and harden in the bags as if it had been wetted with fresh water." The editor says, "although a master should molest or break a cargo as little as possible, yet if he signs for 'good quality and condition' on a 'blind' shipment he does so at the peril of such a liability as that above referred to. The master is not expected or bound to open every package shipped of any one series of goods, but he should make a reasonable and sufficient inspection, and satisfy himself of the probable condition of the whole from the examination of the part selected. In the case put, the master does not appear to have opened any of the sacks; hence, probably his present trouble. In all doubtful cases the master should sign—contents unknown; but there ought to be no such cases."

Tonnage. 140 barrels flour (28 inches long, 22½ bilge, 19½ head diameter), 220 lbs. each, 196 lbs. net, weighing 13½ tons, or 160 sacks, 280 lbs. each, 20 tons, will occupy 850 cubic feet or 1 keel. Eight sacks or ten barrels of Irish flour go to a ton. On the Crinan Canal 16 bolls. In Australia flour is freighted at 2,000 lbs. to the ton. At New York and Baltimore, eight barrels of 196 lbs. each; five cubic feet is the standard contents of a flour barrel at Baltimore.

Freight. When wheat is freighted at 1s. 7d. quarter, flour is rated at 8½d. 7d. barrel or 7½d. 7d. sack. Another authority says, when Mediterranean wheat is freighted at 1s. 7d. quarter, flour should be 6d. 7d. barrel and 5s. 7d. ton of 20 cwt. in bags. Ten barrels are considered a ton. If brought from Spain eight barrels are equal to five quarters of wheat.

Measures. A gallon of flour weighs 7 lbs.; a bushel, 56 lbs.; a boll of 10 pecks or stones, 140 lbs. A pack or load, 240 lbs.; sack or 5 bushels, 280 lbs.; an Admiralty barrel contains 336 lbs. net; half-hogshead, 250 lbs.; and kilderkin, 168 lbs. A culass at Nantes 350 lbs. A barrel of American, 196 lbs.; half-barrel 98 lbs.; sack of flour, corn, or meal, 280 lbs., or 2 cwt. 2 qrs. net. Admiralty barrel oatmeal, 7½ bushels, 360 lbs. net; half-hogshead, 5½ bushels, 253 lbs. net.; kilderkin, 3½ bushels, 172 lbs. net; small cask, 2½ bushels, 115 lbs.; ditto 2 bushels, 101 lbs.

Tonnage for Freight. Basis adopted by the Administration of Customs, for calculating the ton of grain and flour imported with other merchandise, by vessels of all nations.

		TO THE TON.	
BARLEY	Bulk or in bags.....	14 hectolitres	40
	Barrels	11	"
BUCKWHEAT	Bulk	800 kilogrammes	
	Bags	750	"
FLOUR	Ordinary barrels (quarter) ...	8 barrels	
	Bolted, in bags	1,000 kilogrammes	
	Not bolted, in bags	900	"
MAIZE... ..	Bulk or in bags.....	13 hectolitres	
	Barrels	11	"
OATS	Bulk or in bags.....	14	"
	Barrels	11	"
RYE.....	Bulk or in bags.....	13	"
	Barrels	14	"
WHEAT	Bulk or in bags.....	13	"
	Barrels	11	"

* By the Custom-House of Havre, the ton is formed by 14 hecto. 14, but in all other ports of France, it may be 14 hecto. 40; this difference is supposed to have been made in the transmission of copies of the administrative letter.

In the treaty between the United States and France the following quantities are considered as forming a ton of merchandise :—

WINES, four 61-gallon hogshead or 244 gallons of 231 cubic inches, American measure.

BRANDIES and all other liquids 244 gallons.

SILKS and other dry goods, and all other articles usually subject to measurement, 42 cubic feet, French, in France, and 50 cubic feet, American measure, in the United States.

COTTON, 804 lbs. avoirdupois, or 365 kilogrammes.

TOBACCO, 1,600 lbs. avoirdupois, or 725 kilogrammes.

ASHES, pot and pearl 2,240 lbs. avoirdupois, or 1,016 kilogrammes.

RICE, 1600 lbs. avoirdupois, or 725 kilogrammes; and for all weighable articles not specified 2,240 lbs. avoirdupois, or 1016 kilogrammes.

315. **FOUNDER.** A ship is said to founder when she has lost her powers of flotation, and when she sinks below the surface of the sea.

316. **FRANCE.—Coal Charters.** Dieppe, 13th March, 1868. From this date coal charters should contain this clause: "The cargo to be weighed by the sworn meter (peseur jure) whether in railway wagons or in carts." The fixed charges for weighing are per 100 tons in railway wagons, 3*f.*; in carts, 5*f.*—C. E. P. RHODES, *Vice-Consul.*

REDUCTION OF ENGLISH WEIGHTS INTO FRENCH.

	Tons or Kilos.	Cwt.	Quarter.	lbs.	Kels	Chal-drons.	Tons. Cwt.	Kilo-grammes.
		K	K	K				
1	1,015	50'75	12'69	0'453	$\frac{1}{2}$	1	2 13	2,689'75
2	2,030	101'50	25'38	0'906	$\frac{1}{1}$	2	5 6	5,379'50
3	3,045	152'25	38'07	1'359	$\frac{3}{8}$	3	7 19	8,069'25
4	4,060	203'	50'75	1'812	$\frac{1}{1}$	4	10 12	10,759'
5	5,075	253'75		2'265	$\frac{5}{8}$	5	13 5	13,448'75
6	6,090	304'50		2'718	$\frac{6}{1}$	6	15 18	16,138'50
7	7,105	355'25		3'171	$\frac{7}{8}$	7	18 11	18,828'25
8	8,120	406'		3'624	1	8	21 . 4	21,518'
9	9,135	456'75		4'077	2	16	42 8	43,036'
10	10,150	507'50		4'530	3	24	63 12	64,554'
11	11,165	558'25		4'983	4	32	84 16	86,072'
12	12,180	609'		5'436	5	40	106 0	107,590'
13	13,195	659'75		5'889	6	48	127 4	129,108'
14	14,210	710'50		6'342	7	56	148 8	150,626'
15	15,225	761'25		6'795	8	64	169 12	172,144'
16	16,240	812'		7'248	9	72	190 16	193,662'
17	17,225	862'75		7'701	10	80	212 0	215,180'
18	18,270	913'50		8'154	11	88	233 4	236,698'
19	19,285	964'25		8'607	12	96	254 8	258,216'
20	20,300	1,015'		9'060	13	104	275 12	279,734'

317. **FREIGHT.** A shipowner is not entitled to insist upon full payment of freight before delivery of the cargo, except he has reason to believe that the consignee is in an insolvent state, or has some other sufficient motive for holding to his lien until payment is made or security given. At the Queen's Bench, 9th July, 1862, Lord Chief Justice COCKBURN decided in the case *DICKENSON v. LANO*, that plaintiff, owner of the ship *Madam*, having received from LANO a cargo of stone for delivery in London to GEORGE WILLIAMSON, who had absconded, LANO the consignor was liable to pay the freight.

318. **FRUIT.** Care should be taken to keep dry fruit from green. Raisins are very liable to become heated, especially when shipped in bad condition; they will then cause leakage from any casks of liquids near; in a heated state, maggots and other insects are speedily brought to maturity, to the great injury of the cargo and inconvenience of the crew. All unripe fruit is liable to ferment; see fermentation. The hatches of vessels in some fruit trades are built up temporarily three or four feet above the combings, and are fitted with lids to admit air at sea when the weather is favourable. Almonds, being light, are stowed in the upper part of the cargo, where most convenient for trimming. Sweet almonds are imported in serons, casks, and boxes; the bitter in serons; 15 cwt. go to a ton. **Barcelona nuts** are usually packed in bags, weighing about 130 lbs. each, gross; 14 of which go to a ton. Currants were formerly packed principally in butts and caroteels, but of late mostly in barrels and cases. Although cases stow closer than barrels they are very disadvantageous to carry, because freight is paid on the net weight, and a case which contains 1 cwt. of currants, has as much wood in it as a barrel which contains 2 cwt. Importers, however, find that cases are more convenient for sale; perhaps the terms of charter-parties might be so arranged as to meet both interests. Currants (from Corinth) are found in great perfection along the shores of the Corinthian Gulf, in Cephalonia, Ithaca, and in Zante, in which island the cultivation engrosses nearly two-thirds of the cultivated land. The instructions which follow apply chiefly to stowage on board sailing ships; but the greater portion of the fruit is now conveyed to London and elsewhere in large screw steamers, most of them especially adapted for carrying every description of green or dried fruit, and the position of the engines and boilers in reference to the cargo, has been duly considered and arranged; these steamers command and obtain the highest rate of freight, especially at the commencement of the season, on account of their certain and rapid passages, even when a large number of vessels are lying in the ports waiting, and others are crowding in daily.

319. As a rule the **shipping season** in Europe for fruits, nuts, &c., is in September, October, and November; oranges much later. After a wet harvest or gathering time, fruit may be delayed considerably before it is ready to ship. **CURRENTS**, in the *Ionian Islands*, are ripe in August; fourteen days to three weeks are required for drying. Formerly they were never shipped before the beginning of September, and the crop continued to be forwarded by clippers until May; not more than one-half to two-thirds being shipped before Christmas. Now the crop is forced forward earlier, and double the quantity is nearly all exported by the end of November, in screw-steamers. *Greece (Patras and Zante)* commences say in August and continues till the spring; nearly all is shipped before Christmas. **RAISINS and ALMONDS**: *Ionian Isles, Coast of Spain, &c., (Malaga and Denia)* commences in August or September and closes usually before January. From the *Ionian Isles*, no raisins. In *Malaga* the harvest for raisins is in June. **RAISINS and FIGS**: *Smyrna* figs, after harvesting require about a week to dry. The first shipments occur usually between the 1st and 10th of September and the first arrivals in England occur in the latter part of September and the early part of October. The bulk is shipped in September and October. The fruit warehouses can scarcely be considered to be open except from the 20th of August to the 20th of November. The shipment of *Sultana* raisins commences in *Smyrna* about a week before figs. *Chesmeh, Vourlah, and Carbonara*, a month after figs. There are exceptional occasions when raisins in quantity remain undelivered up to January, and even to February and March.

320. **Patras currants** are shipped in casks of various sizes. Certified stevedores are employed to stow them; if the casks are not stowed sufficiently compact the stevedore is fined. *Morea* fruit shipped at *Patras* is often very dirty. The schooner *British Queen*, 105 tons reg., new new measurement, and 142 builder's measurement, took in a full cargo of *Patras* currants after the rainy season of 1853; they weighed out net only 86 tons, whereas a full cargo two years before, after dry weather, weighed 134 tons; the cargoes were equal in bulk. This statement appears open to doubt. It is said that in 1853, *oidium* existed in fruit to such an extent, that very little beyond the husks reached England. There may be some discrepancy in the weights net and gross; there is, however, no doubt that currants are much heavier when the season has been such that they could arrive at maturity and admitted of careful drying afterwards. The *British Queen* carries 170 tons dead-weight, say iron or coal, and of wheat 850 quarters Egyptian or 800 quarters Russian. Her

freight of Marsala wine is 103 tons with 30 tons brimstone ; Palermo shumac 131 tons ; St. Michael's oranges 39 tons, viz. : 726 large boxes, 20 to the ton, and 43 small boxes, 30 to the ton ; Russian sizes. This schooner is 73 feet long, 19 broad, and 11'9 feet deep in the hold. The schooner *Whisper*, Capt. WOOD, built by Mr. LAMORE, of Guernsey having loaded fruit at Patras, left there 23rd September, 1862, and arrived at Plymouth 15th October—22 days. She registers 102 tons, is 107 feet long, and 20 feet broad. Her cargo consisted of 118 tons of currants ; among the casks there were about 12 tons of shingle, and she had 10 tons of iron ballast aft to keep her by the stern. She drew 8 feet 6 inches forward, and 11 feet aft—her best trim for sailing. With 170 tons Welsh coal (the iron ballast being below) she draws 9 feet forward and 12 feet aft. This cargo of currants weighed 15 tons more than any previous cargo brought by the *Whisper* ; the master attributed the difference to the weather which prevailed in the preceding summer. Several schooners belonging to Brixham are built purposely for the Mediterranean trade, and are engaged almost entirely in it ; they are long flat vessels with sharp ends, but much sharper aft than forward, so much so that little or no dunnage is required beyond the ballast, which is all placed in the narrow part of the hold. One of these schooners, the *Ocean Bride*, registers 144 tons, is 120 feet over all ; keel 92 feet ; extreme beam 20 feet ; and depth of hold 11 feet 6 inches. She took in at Patras, in 1860, 180 tons (net) currants, viz. : 1,400 barrels and 100 cases. The ballast 20 tons, was all stowed abaft the main hatchway. With this cargo she was 8½ inches by the stern, in good trim ; the upper part of the bends just awash. She will stow 50 tons of St. Michael's oranges—20 boxes to the ton, with 55 tons of ballast ; her draught then is 9 feet forward, and 10 feet 5 inches aft. With 250 tons of Swansea patent fuel she draws 11 feet forward, and 12 feet 6 inches aft. In reference to shipments by screw steamers, an experienced master says (26th June, 1867) Patras currants are shipped in barrels containing about 2½ cwt. and cases averaging a little more than 1 cwt. The latter should be engaged freely for filling up and especially for the saloons and every available place in the cabins, with a view to keeping the vessel well by the stern ; otherwise she will load very much by the head, and be unable to steam. The merchants and shippers send off their own gangs of stevedores, who stow their own packages only and that very indifferently, causing the master great trouble and annoyance, as the gangs relieve each other with every change of mark, and in the event of the stowage being complained of, the then working gang will quite ignore the fault as

being theirs. The ship being charged 1*d.* ~~per~~ package, large or small, for stowing, the master should have the selection of a fixed set of labourers for the purpose ; as it is the officers who can be spared from the gangways, and the greater part of the crew, are obliged to be constantly in the holds, to watch and protect the interests of the ship. The system has been greatly reprobated and with justice. These remarks apply chiefly to the shipment of currants at Patras, Zante, and Cephalonia. When vessels proceed to **Vostizza**, (where the fruit is considered heavier and of better quality generally than that shipped at Patras), or round the coast of Katikolo, opposite Zante on the main, to partially load, they occasionally take round with them a stevedore's gang. In Katikolo steamers have taken currants on board in bags, having all the empty barrels brought from Patras. For many days a whole tribe of Greek labourers have been occupied on board filling the barrels and trampling down the currants ; and native coopers also in heading down when full.

321. When loading currants at **Zante**, say in a sharp schooner of 115 tons register, place the largest casks each side the keelson amidships, the lesser fore and aft, to suit the shape of the hold ; when chartering, secure sufficient small casks to fill up. Dunnage is found by the ship, and is placed as usual in the bottom, and slightly up and down the sides ; fustic is sometimes shipped as dunnage, free of freight. A schooner of 115 tons register, *o.m.*, will take her tonnage of net fruit. A vessel 11 feet 8 inches in depth will take three heights of butts of currants with the usual dunnage. When chartering, endeavour to obtain packages suitable for stowage. One charter-party, said "in butts, caroteels, barrels (and or) cases, sufficient small packages for stowages ;" she was given two-thirds of her cargo in *cases*, and having a few of each of the other packages named, the master could not refuse ; but the shipment of so many *cases* threw her 10 tons out of her proper cargo. Steamers have a very large proportion of the trade to England now. Zante fruit is usually very clean.

322. From **Valentia** to England, raisins are generally freighted at per ton of 20 cwt. Quantities of oranges have been lately shipped here. At **Denia**, the average crop of raisins is 9,800 tons. Some Denia charter-parties say "ship to be well and sufficiently dunnaged with wood or stone, and not rosemary or any deleterious substance whatever." Almonds are sometimes shipped here in their shell in bags, and shelled in boxes and barrels ; the trade is chiefly in raisins and almonds. 101 lbs. Spanish 101½ lbs. English. Tares on Denia raisins in boxes half-cwt. 56 lbs. each ; half-ditto, 28 lbs. ; quarter-

ditto, 14 lbs. Trade, 10, 6, and 3. Customs' tare as much as can be got. At **Leghorn** vessels remain in the roads until half their cargoes at least, is discharged. The expense of lighterage and packing at this port is said to be high.

323. At **Malaga**, the schooner (115 tons) requires 10 or 12 tons shingle, pebble, limestone, or other dry ballast; barrels of grapes encased in mats, forward, say three or four tier: amidships and aft, boxes and half-boxes of raisins right up to the beam; lemons aft by themselves, to protect other goods from their steam; melons on deck; almonds on the top of raisins; figs in the wings. The tare on Malaga dry fruit is rather more than that of Denia; and vessels, when laden with part lemons, grapes, &c., do not carry near so much tonnage. The quantity of grapes ought to be limited, or additional freight paid. As much pig lead as may be required for fruit cargoes, can be obtained for ballast, freight fee. Tares on 28lb. boxes, 7 lbs.; 14 lb. 4 lbs.; 7 lb. 2 and 3 lbs.

TONNAGE AT MALAGA.

80 Boxes @ 25 lbs. Raisins or Figs	85 Arrobas, net, Olive Oil
20 Barrels 50 lbs. Grapes	20 Quintals Lead
60 Boxes @ 25 lbs. Almonds	5 Chests
5 Barrels @ 300 lbs.	10 Half-Chests
80 Boxes Figs	20 Quarter-chests of Oranges or Lemons
80 Drums or frails 25 lbs., net, Figs	4 Bales 300 lbs. Orange or Lemon Peel
20 Barrels Raisins	
2 Butts or pipes or 60 @ Wine.	

Freight is, however, generally paid in England by the ton of 20 cwt. The boxes of almonds taken as containing 25 lbs. sometimes contain 28 lbs. 25 Castilian lbs. 1 arroba; 4 arrobas or 100 lbs., 1 quintal. 100 lbs. Castilian = 101'44 lbs. avoirdupois.

324. At **Alicante**, in October, 1863, the brigantine *Acadian*, Capt. J. WYATT, discharged coal; she was built at Nova Scotia, registers 122 tons, has a round bottom, with no great depth of hold—only 10 feet 9 inches; breadth 25 feet, and length 85 feet; with her cargo of 200 to 205 tons of West Hartlepool coal she drew 11 feet 4 inches aft, and 10 feet forward. The out-put at Alicante was two tons short. The coal was carried ashore exclusively by Spanish labourers (about 20 tons per day) in small baskets which were exposed some hours to the sun, when much weight was lost. It was then weighed by the railway authorities at a distance from and beyond the control of the master. After discharging, the *Acadian* took in 20 tons of stone ballast and proceeded to Jabea, 50 miles east, where she received, in November, 125 tons of raisins, viz.

9,000 boxes of 28 lbs. each, and 500 of 56 lbs., with which she drew 10½ feet, and went to Philadelphia and loaded petroleum, which see.

325. At **Jabea**, some of the brigantine's disbursements were as follows :—

	dol.	r.	m.
Pilotage	1	0	0
Stevedores	10	0	0
Consul	12	5	25
Dispatching papers	1	0	0
Custom-House	2	0	0
Provisions	11	0	0
Cash in <i>Jabea</i>	192	0	0
	<hr/>		
	\$229	5	25

Reckoning 4s. 4d. ₤ dollar, these disbursements amount to £49 13s. 6d. In the Consul's charges were quarantine and pratique 45 *rials* 8 *mrs* ; Port Captain 4 *rials* ; registration 2s. 6d. ; signing manifests 10s. ; requests for Custom-house visit 5s. ; certificates to Board of Health 5s. ; Port Captain 5s. ; Customs 5s. ; Bill of Health 10s.

326. At **Alicante**, some of her disbursements were :—

	dol.	rials.
Anchorage, 2 <i>rials</i> ₤ ton	13	8
Light dues, 1 ditto	6	14
Tonnage dues, ¼ <i>rial</i> ₤ quintal	55	5
Duty of consumption of foreign stores 12-100 of a <i>rial</i> } for each man ₤ day	0	13
Port Captain	0	4
Ballast guard	0	16
Bill of Health	0	6
Pratique charges \$5 2 <i>rials</i> . Consul's do. \$5 8 <i>rials</i> ...	10	10
Contribution towards the new Protestant Cemetery	1	0
Translation of ship's clearance and certificate, manifests, } revenue visit, and clearing ship's papers	3	0
	<hr/>	
	\$91	16

The Consul's charges: registration 2s. 6d. ; request for Customs visit 5s. ; certificates Board of Health 5s. ; port charges 5s. ; Custom-house 5s.

327. **Oranges and Lemons.** A ship will ordinarily require one-fourth of her tonnage for ballast ; boxes of oranges are stowed on their sides, bilge to back, as many tiers as the hold will take ; top tier bilge up. Lemons, being heavier, are generally stowed below oranges. Discharge in dry weather. Some Lisbon charter-parties are as follows : "as much as can be stowed in the hold between the fore and after bulkhead ; to be stowed in the customary manner, so as to

allow an air-hole two feet square under each hatchway, to extend from the bottom of the hold to the top of the deck ; which air-hole is to be kept empty and free of all sails, cables, &c. Windsails are to be used down such air-holes ; and part of the bulkheads are to be removed to afford ventilation to the cargo. The vessel to be ballasted with iron, metal dross, stone, or shingle ; not sand, chalk, mud, or anything prejudicial to fruit. The victuals to be cooked upon deck and not below. The hatches, to be kept open at all times during the voyage, when the weather will admit." Importers complain that green fruit cargoes are often damaged through the inattention or want of information of masters, some of whom will deliver fruit in better condition after a passage of thirty days than others after a passage of only fourteen days.* **Fruit** is frequently carried on deck ; when so carried it should be noted on the bill of lading.

328. **Can hooks.** In the Sheriff's Court, London, 19th January, 1854, OELRICKS v. ROBINSON, the owner was declared liable for the loss of a cask of currants, through lumpers negligently using can hooks, when discharging in the Thames, during the swell caused by passing steamers.

329. **Damaged Currants.** FACHIRE v. MILNES. Before Lord Chief Justice ERLE, 11th December, 1860. Plaintiff, 16th July, 1859, chartered the auxiliary screw steam-ship *Unanimity*, from Cardiff to Marseilles, and thence to Patras to load currants. Through defects in her machinery the vessel was 74 days on the voyage, which was three times as long as she should have been. The cargo was damaged, and currants in the meantime fell in the market. An arrangement was made and a verdict by consent of plaintiff was entered.—Damages £300.

330. **Bill of Lading.** HONISCHER v. ROBINSON. Before the Recorder of London, 27th March, 1862. This was an action for 45 boxes of figs shipped in the screw-steamer *Onda*, at **Smyrna**, in September, 1861. Plaintiff through his brother shipped 500 boxes marked "Eleme" with the letter "D" over the same. The bill of lading contained a clause to the effect that the owner was not responsible for wrong delivery, caused by an error or deficiency in the marks and numbers. 450 boxes, properly marked were first delivered. Five others were afterwards found. Then 45 marked "Eleme—D" were offered and refused, and this action was brought for their value at 32s. 7d. cwt. 80,000 cases and boxes of fruit had

* The average annual imports of oranges into Great Britain, for the five years ending with 1860 were 977,440 bushels. Since then it has gone beyond 1,000,000 bushels, and, assuming each bushel to contain 650, this would give 65 millions of oranges, or about 22 for each soul of the population in the Kingdom. Each tree produces on an average 12,000 to 16,000 ; one tree has yielded 26,000. In the season of 1851, which produced by no means an unusually large crop, not less than 353 cargoes of oranges, containing about 200,000 large boxes, holding 800 oranges each, were shipped from the Western Islands. Terceira exports annually about 30 cargoes. St. Mary a few. St. Michael's is the great mart. In 1801, the value of the fruit imported thence was but £10,000 ; in 1850, £65,000 ; and in 1859, £84,123. It was estimated that its produce of fruit during 1859, was 252,000,000 of oranges and 40,000 lemons ; of these all the lemons and 49,000,000 oranges were consumed on the island. The exports of oranges from St. Michael's was 179,379 boxes in 1852 ; 123,327 boxes in 1855-6 ; 100,079 in 1856-7 ; 179,992 in 1857-8 ; and 130,858 boxes in 1858-9. More than half of the orange crop is shipped in the months of November and December. The value of the fruit imported now reaches over £600,000 annually.

been shipped in the *Onda*, of which 40,000 were boxes and drums of figs. It was alleged that the 45 boxes missing were delivered by mistake to some other party. Plaintiff stated that stencil plates were used in painting the marks. His brother had different marks. In defence it was stated that an offer to open the 45 boxes tendered, and to test the quality had been refused. Capt. BATTY stated that the *Onda* took in 1,000 tons of cargo, which came off in barges to the ship in the bay. They could not see the marks of the whole of the cases and boxes shipped. RECORDER: Then if you could not see the marks you should not sign a bill of lading for 500 boxes of a particular mark. Capt. BATTY said he had no means of knowing the marks. The mate gave a receipt when the goods were on board. They had not time to look at the whole of the marks. RECORDER: Then you ought not to sign the bill of lading, when you have not time to do it. The mate SWANSON, said that with a cargo of 80,000 cases it would be impossible to see that the whole of the marks corresponded with those in the shipper's note. WILLIAM FRIEND, warehousekeeper, London Docks, stated that there were 445 boxes marked "Elme--D." They found 41 "Elme--B," and 4 with no letter. Had no complaint from any other party, and no one claimed the 45 boxes tendered—Verdict for plaintiff.

FRUIT PACKAGES, &c.

CURRENTS. 17 tons occupy a space of 850 cubic feet or 1 keel; a butt weighs 17 to 20 cwt.; caroteel 5 to 7 cwt.; box $1\frac{1}{2}$ to 3 cwt.; barrel $2\frac{1}{2}$ to $2\frac{3}{4}$ cwt.; sack of Grecian 140 lbs. ordinary or about 123 lbs. avoirdupois.

RAISINS. A drum 24 lbs., barrel 1 cwt.; cask Malaga 1 cwt.; Turkey $2\frac{1}{2}$ cwt.; box Malaga 22 lbs.; Valentia 56 lbs., half-boxes 28 lbs.; a seron is a kind of skin package, containing usually $87\frac{1}{2}$ lbs.; Admiralty barrel 336 lbs. net, half-hogshead 224, kilderkin 168, and small casks 112 lbs.; see table at the commencement of this work.

FIGS. A frail of Faro 32 lbs.; Malaga 28 lbs.; Malaga drums 14 lbs.

PRUNES. A barrel 1 to 3 cwt.

PLUMS. Quarter-box about 20 lbs., carton 9 lbs.; half carton 4 to 6; quarter carton 2 to 4 lbs.; these are usually packed in outer cases.

ALMONDS. A box of Jordan 28 lbs.; a basket contains $1\frac{1}{2}$ to $1\frac{1}{2}$ cwt., and a seron $1\frac{1}{2}$ to $1\frac{1}{2}$ cwt. A seron of Barbary contains about 2 cwt.

NUTS. At Barcelona 14 bags of 130 lbs. gross go to a ton.

GRAPES. At Malaga 20 barrels go to a ton for freight; some say 25.

Freight. When Mediterranean wheat is 1s. per quarter freight, raisins are rated at 6s. 8d., and currants 6s. 3d. $\frac{7}{8}$ ton of 20 cwt. net weight. These rates have been very much modified since the introduction of steamers from Liverpool to the Mediterranean; they take back fruit at the best freight they can obtain, say 55s to 70s. and 10 $\frac{7}{8}$ cent. primage at the first of the season. By the Levant Co.'s rates figs in drums are freighted at £5; in casks and cases £4. A master states that the stowage at Smyrna, whether in drums, casks, or cases, is nearly equal; there may be a difference of 5 $\frac{7}{8}$ cent. in the stowage, but in the payment for freight there is a difference of 20 $\frac{7}{8}$ cent.

Tares. The tare for Zante currants allowed by the Customs and the trade is for butts 18 lbs. $\frac{7}{8}$ cwt. (very rare now), caroteels 20, boxes and barrels actual; the smaller the packages the greater the tare. Caroteels are not made of the same

wood as formerly ; say 10 or 12 $\frac{1}{2}$ cent. now. On currants 16 to 20 $\frac{1}{2}$ cent. Denia raisins 6 to 7 lbs. on half-boxes, 11 lbs. on boxes. At Hamburg the tare on raisins are Smyrna, new or old, 12 $\frac{1}{2}$ cent. ; Malaga, new or old, 10 $\frac{1}{2}$ cent. Currants—Trieste, 14 to 16 $\frac{1}{2}$ cent. ; Smyrna figs 12 $\frac{1}{2}$ cent.

Lastages. At *Malaga* a last for freight is, 4 bales of orange peel, 10 casks almonds (each about 380 lbs. English), 20 chests lemons and oranges, 22 casks almonds (8 arrobas each), 44 casks raisins (4 arrobas each), 87 half-casks raisins, 50 baskets or 160 jars of raisins. A carga of raisins is 2 baskets or 7 arrobas ; a cask contains as much though only called 4 arrobas ; the arroba 4'19 English wine gallons. At *Rotterdam*, a last for freight 300 lbs. almonds, and 20 cases of oranges.

Proportionate Tonnage. 8 tons of oranges and lemons, of 10 chests or boxes per ton, will weigh 10 tons, and occupy a space of 850 cubic feet or 1 keel ; 10 chests, 20 half-chests, or 30 quarter-chests, go to a ton. 30 Russian-size boxes are equal to 20 London-size boxes. Some masters calculate that a vessel which stows 18 tons of St. Michael's will stow 28 tons of Seville, and 30 tons of Lisbon or St. Ubes. A schooner which stowed 38 $\frac{1}{2}$ tons of St. Michael's stowed 52 tons Lisbon. When St. Michael's oranges pay freight averaging £7 to £8 $\frac{1}{2}$ ton, Lisbon oranges pay about £4 10s.

Proportionate freight. When wheat is freighted at 1s. $\frac{1}{4}$ quarter, oranges and lemons are rated at 12s. 1 $\frac{1}{4}$ d. $\frac{1}{2}$ ton ; some consider this rate 20 $\frac{1}{2}$ cent. too much in favour of the wheat ; and a fruit merchant reckons 1s. $\frac{1}{4}$ quarter for wheat equal to £1 $\frac{1}{2}$ ton for St. Michael's oranges. Another authority says, when Mediterranean wheat is 1s. $\frac{1}{4}$ quarter, oranges and lemons are rated at 8d. $\frac{1}{2}$ case, or 12s. $\frac{1}{2}$ ton ; this refers to Sicilian cases containing about 1,000 fruit. A box is two-thirds of a case, and pays accordingly ; a thousand of those cases count for 50 tons. From the Azores 20 English and 30 Russian-size boxes count to the ton ; from Spain or Portugal 10 chests or 20 half-chests or boxes count to the ton. 8 Admiralty cases of lemon juice or 16 half-cases 1 ton.

331. **FUEL, PATENT.** WARLICH'S is made in blocks 9 inches long, 6 inches broad, and 6 inches thick, and being thus perfectly cubical, can be stowed in much less space than coal, a ton of 20 cwt. occupying only 32 $\frac{1}{2}$ cubic feet, where the same weight of coal occupies 40 feet. It is apparent that a ship would not float if completely filled, and it is therefore customary to stow in solid blocks or tiers right up to the beams, with spaces between to meet the trim of the ship. At *Swansea*, a shoot with an indiarubber base is used ; through this it is shot with so much rapidity, that 1,200 tons have been stowed in 24 hours. This fuel is much less absorbent than coal, and there is consequently less danger in case of leakage, and steamers are thus enabled to carry two days' consumption on deck, where it is stowed solid—the sides being formed in steps, for facility of access. Patent fuel is liable to spontaneous combustion. The Emigration Board does not object to WARLICH'S, WYLAWS' or the NORTH & SOUTH WALES Co.'s, a ton of which can be stowed in 31 cubic feet.

FUEL, STEAM.

EXTRACT FROM THE FIRST "REPORT OF THE COAL AND FUEL SUITED TO THE STEAM NAVY, BY SIR H. DE LA BECHE AND DR. L. PLAYFAIR," MARCH, 1848.

Names of Patent Fuel and Coal employed in the experiments.	Weight of 1 cubic foot of the Fuel, as used.	Weight of 1 cubic foot, as calculated from the density.	Ratio of the economic to the theoretic weight	Difference % cent. between theoretic and economic weight.	Space occupied by 1 ton in cub. ft. economic weight.
Fuel, Patent.	lbs.	lbs.			feet.
Warlich's	69'05	72'248	'955	4'49	32'44
Lyon's	61'1	74'73	'817	22'30	36'66
Wylam's	65'08	68'629	'948	5'45	34'41
Bell's	65'3	71'124	'918	8'91	34'40
Holland and Green's	64'8	81'23	'797	25'35	34'56
Coal, Welsh.					
Ebbow Vale	53'3	78'81	'676	45'98	42'26
Powell's Duffryn	53'22	82'72	'643	55'43	42'09
Nixon's Merthyr	51'7	82'29	'628	59'16	43'32
Resolven	58'66	82'354	'712	40'39	38'19
Graigola	60'166	81'107	'742	34'8	37'23
Ditto Birch Grove	51'0	84'85	'601	66'37	43'92
Llangonnoch	56'93	81'85	'695	43'76	39'34
Pentrefilen	66'166	84'726	'781	28'051	33'85
Newcastle, &c.					
West Hartley Main	48'9	78'86	'620	61'26	45'80
Buddle's West Hartley	50'6	77'11	'656	52'39	44'09
Carr's Hartley	47'8	78'23	'611	63'66	46'86
Davison's West Hartley	47'7	78'36	'608	64'27	46'96
Derwentwater Hartley	50'4	78'79	'639	56'32	44'44
Original Hartley	49'1	77'98	'629	58'81	45'62
Cowpen & Sidney's Hartley	47'9	78'67	'608	64'23	46'76

332. **Spontaneous Combustion.** The brig *Nonpareil* left London, 27th January, 1856, with a cargo of Etna fuel in bags, and when abreast of Malta, 7th March, the cargo took fire and the ship was burnt. This fuel is said to be composed of resin, sawdust, and small coal; it is made in sheets of 42 squares--the sheet measuring $15\frac{1}{2}$ by $10\frac{1}{2}$ inches, and is adapted for cooking in trenches dug in the ground. The manufacturers allege that it is not liable to spontaneous combustion. The fire may have originated in the bags, the cargo having been shipped in wet weather.

333. **FURNITURE.** Bengal, Madras, and Bombay ton 50 cubic feet.

334. **FURS.** The Russian Company on the Amoor River, send their furs to St. Petersburg chiefly by land. Those by ships are stowed principally in the 'tween decks covered with canvas, but the

canvas is kept about six inches from the top of the furs, by pieces of wood, two to three inches apart, to secure ventilation. Iron ships are not preferred for the conveyance of furs. The sables most esteemed in Russia, are those which are short and broad. New York ton 40 cubic feet of beaver, furs, peltries, &c.

335. FUSTIC, the wood of a species of mulberry growing in the Ionian Islands, Greece, South America, the United States, and the West Indies. Fustic shipped as *dunnage*, free of freight, should be so stated in the mate's receipt and corresponding bill of lading, and the quantity described at Patras or any other Greek port as a *boat load*. New York ton 20 cwt. Baltimore 2,240 lbs.

336. GALANGAL; the root of the galanga tree cut in pieces an inch long and scarcely half-inch thick. At Bombay 12 cwt. go to the ton; in China 13½ bags.

337. GALBANUM; a species of gum resin growing near the Cape of Good Hope, in Syria and Persia; from the Levant it is brought in cases or chests, from 100 to 300 lbs. each. East India Co. allows 16 cwt. to a ton.

338. GALLS OR GALL NUTS are excrescences produced by the attacks of a small insect, which deposits its eggs in the tender shoots of a species of oak (*Quercus infectoria linn*) abundant in Asia Minor, Syria, Persia, &c. Galls are inodorous, and have a nauseously bitter and astringent taste. They are nearly spherical, and vary in magnitude from the size of a pea to that of a hazel nut. When good, they are of a black or deep olive colour; their surface is tubercular and almost prickly; they are heavy, brittle, and break with a flinty fracture. They are known in commerce by the names of *white*, *green*, and *blue*. The white galls are those which have not been gathered till after the insect has eaten its way out of the nidus and made its escape. They are not so heavy as the others, are of a lighter colour, and do not fetch so high a price. The green and blue galls are gathered before the insect has escaped; they are heavier and darker than the former, and are said to afford about one-third more of colouring matter. Bombay ton 50 cubic feet in cases. A sack 3½ cwt.

339. GAMBIER, an extract prepared at Singapore from the *uncaria gambir*; in the island of Bintang, the shrubs are in full bearing ten months in the year, but during December and January the leaves change to a yellow colour and are unfit to produce the extract; it is used as a dye and tanning substance. It is sometimes

misnamed terra japonica and cutch, but they are the produce of other plants. Gambier is a plant of a sticky nature, and when shipped it should be kept off from sago, sugar, coffee, spices, &c. ; occasionally it is packed in rattan baskets, holding about 1 cwt. each, and sometimes is made up in compressed bales 2½ cwt. each, dunnaged with Malacca and rattan canes. If freighted at 20 cwt. to the ton, the bales should be well pressed ; if by measurement there should be 50 cubic feet to the ton ; see catechu and terra japonica.

340. According to an experienced master it is shipped at Singapore principally in bales weighing over 1 cwt., although considerable quantities are made up in irregular-shaped rattan baskets. As this is the main article of shipment from Singapore as dead-weight, it is generally floored along fore and aft, being well dunnaged with rattans, space being left forward or in both ends of the ship, for castor or cocoa-nut oil, in casks or cases. From the yielding and soluble quality of the cargo, it is likely to settle considerably during a protracted voyage, and the loss of weight from exuded moisture and evaporation has been estimated at 5 $\frac{1}{2}$ cent.—such at least is the quantity returned as loss from account sales. Modern iron-built and composite ships have an advantage in the well-fitted ventilating shafts introduced fore and aft in various places, as well as having the three iron lower masts hollow, with caps fitted with screw covers, which enables a vast amount of vapour and steam to pass off. In fine weather hatches should be invariably taken off during the day, and steam wiped off from around the combings and every place that was accessible overhead in the between decks and elsewhere ; this is the more necessary from the fact that if sago or flour in bags forms the upper part of the cargo, it is likely to become damaged from the dropping of the steam, in the form of water, which has become condensed on the beams, decks, and hatches. Bundles of rattans, over mats spread on the gambier bales, should be used freely before stowing any other description of cargo in bags, such as sago, flour, coffee, or cloves.

341. Gambier frequently gives great trouble to break out and discharge, forming as it does, under great pressure, a solid and almost inseparable mass. Masters rarely attempt to obviate this by matting between packages, owing to the heavy expense and the knowledge that the dock companies have all the wear and tear of the discharge.

342. **A bale ?** In the Court of Common Pleas, 16th December, 1856, *GORISSEN v. PERIN*. According to plaintiff's case, a bale of gambier meant a parcel, weighing above 2 cwt. which had been compressed by hydraulic power

into an oblong mass, and was then bound up in matting. Defendant had brought from Singapore 1,170 parcels bound up in matting but not compressed, and weighing only 60 or 70 lbs. each, which he contended were bales. The jury found that they were not bales.

343. **GAMBOGE**, a vegetable gummy juice of a most beautiful yellow colour, brought chiefly from Cambodia. China box, 1 pecul, measures 4'236 cubic feet.

344. **GARLICK** and onions. Bengal and Madras ton 12 cwt.

345. **GENERAL CARGO**. Select the strongest casks, such as beer, tallow, &c., for the ground tier, and not dry goods if it can be avoided, reserving wines, spirits, oils, vinegar, and molasses for the second or third tier, to reduce the pressure, according to size of ship. Although stevedores may be employed, the attention of the master or mate should be especially directed to prevent dry goods, in bags or bales, from being placed near leakage goods or moist goods, such as salted hides, bales of bacon, butter, lard, grease, &c.; dry goods should, if possible, be stowed in the after hold.

346. **Manufactured goods**, dry hides, and other valuable articles, should have dunnage, 2½ inches thick, against the sides, to preserve a water course. Miscellaneous goods, such as boxes of cheese, kegs and tubs of lard, or other small or slightly-made packages, not intended for broken stowage, should be placed by themselves and dunnaged as other goods, and if practicable, stowed at each end of the vessel.

347. Tea, flour (in barrels), flax, clover, and linseed, or rice in tierces, coffee and cocoa in bags, should always have 9 inches at least of good dunnage in the bottom, and 14 to the upper part of the bilges, with 2½ inches at the sides; allowed to stow six heights of tierces and eight heights of barrels. Another authority considers that four heights of seeds, &c., in tierces, and five of flour in barrels, is sufficient, but adds that where small battens are laid across a great relief of pressure will ensue. All ships above 600 tons should have 'twixt decks or platforms laid for these cargoes, to ease the pressure. Caulked 'twixt decks should have scuppers in the ceiling at the sides, and 2½ inches of dunnage, laid athwartship and not fore and aftways, when in bags or sacks, and when in boxes or casks not less than 1 inch. When mats can be procured, they should be used at the sides for tea, &c. Such articles as **guano**, superphosphate, bone dust, &c., ought not be shipped with a general cargo of dry goods. In carrying general cargoes from ports where there are no fixed rates like the Mediterranean and the Baltic, the best way to decide

upon the freight due is to reckon how much freight a full cargo of the standard article named in the charter, say wheat, would produce, and take that as the amount due on the cargo actually shipped.

348. **West India Cargoes** should have at least 6 inches dunnage on the flat bottom, and 9 on the bilges, three beds under each sugar hogshead, and two under each cask. Casks of rum and molasses, with bungs up, to be well bedded and quoined off, stowed bilge free, and well chocked; on no account to exceed four heights of riders. To be careful not to stow rum, molasses, or other liquids, on coffee, or any other goods liable to be damaged by their leakage. If coffee, pimento, or other goods in bags, should form part of the cargo, they may be either stowed in a vacancy by themselves, or on the other cargo, provided the cantlines of the casks be well filled with wood, &c., to prevent the bags from being chafed by the working of the casks at sea. Should the whole cargo be in bags (say coffee), staves or matting, or both, should be placed all the way up the sides, around the pump-well, masts, stanchions, &c. If a vessel have the lower deck laid and caulked, it will be necessary to dunnage it also.

349. In stowing a ship of 500 tons register, *o.m.*, having a beam of about 35 feet, with a full **cargo of sugar** in hogsheads, the following course has been observed advantageously for many years. Long wooden hoops, laid athwartships, so as not to impede the molasses' drainage, receive 12 to 14 lancewood spars fore and aft. Commence the ground tier by placing the midship hogsheads alongside the keelson fore and aft; next lay a row of hogsheads, burton-fashion, from abaft the after hatch to before the fore hatchway, round those previously laid admidships; then fill up the wings by laying a row fore and aft, well on, which completes this tier. Next tier all fore and aft, then begin to peak up to the deck at both ends. Third tier, square up. Fourth, burton-fashion from the after part of the main hatch to the after part of the fore hatchway; the remainder fore and aft. Between the beams burton. In the 'tween decks puncheons of **rum**, all the wing casks, burton, from the after part of the main hatch to the rising of the forecastle deck. All the rest fore and aft. Pimento and ginger on the rum, but out of the way of deck leakages from the waterways, windlass, stanchions, &c. The casks of rum must be chocked and bedded with soft wood. The bilges of the casks to be free and bungs up; hanging beds. Barrels of ginger must be on their heads.

The following is abridged from MURPHY'S U.S. Nautical Routine :

350. **Liverpool cargo.** In the fall of the year, about 150 or 200 tons of coal are levelled fore and aft in the bottom. Then a

proportionate quantity of pig or bar iron, with strips of board, at intervals, to prevent the iron from burying itself in the coal. Crockery in the wings, fore and aft. In the after hold, articles of particular value, such as cloths, laces, mousseline de laines, and other dry goods, with plenty of dunnage and chocks, not only against leakage, but to prevent chafe—an injury worse than any other. In the fore hold and the forward part, “rough freight,” such as crates and hogsheads of stone and earthenware, chocking and dunnaging all safely. Sacks of salt in the main hold, near the centre. **New Orleans cargo**: if liquids, such as oils, brandies, cider, vinegar, &c., place them on the ballast in the after hold, with bales and cases of dry goods over. In the main hold, hardware, &c. Fore hold, or all forward, rough freight, such as hogsheads of light hardware, crates of crockery, casks of oil, &c., chocking and dunnaging in a proper manner. **French goods** require great care; dunnage at least 12 or 14 inches high over the floor heads. Stow the cases in the after part free from the wings, masts, pump-well, &c., protected at every point from contact with moisture. Baskets of champagne and other light wines, being less valuable, are placed separately, to prevent leakage on silks, laces, &c.

351. GENERAL SHIP. A vessel engaged to convey to a certain port or ports of destination, the goods of various merchants unconnected with each other.

352. GINGELLY SEED. Capt. W. W. STEVENS, of the barque *Echo*, (see flour, sec. 310) states: while at Colombo, previous to chartering, he was informed by the merchants that all ships invariably carried full cargoes *without ballast*; at Madras and at Pondicherry he was told the same. A vessel built for light cargoes, might do so, but even then it would be preferable to have a little stone or other suitable ballast, if it could be easily procured. The *Echo* having gone round to Madras, her first loading port, he determined, after consulting the table of proportionate weights per bushel, in STEVENS ON STOWAGE, and comparing the weight of this seed with that of other produce, to ascertain what quantity she was likely to carry, to retain from 15 to 20 tons of good stone ballast, which was already on board, especially as the vessel was rather crank. This was done not only to stiffen her, but to keep her by the stern—an important necessity; she would have been better with 5 tons more. She arrived at Madras, in April, 1869, and not being able to sell the ballast, he got rid of some to vessels in port, requiring it for cargoes of cotton, &c. Sufficient seed having been taken in to make the

vessel safe, she went out, discharged the rest over board, and returned to port. At Madras, 2,848 pieces of red-wood, about 17 tons, were shipped as dunnage at half freight, by fresh charter-party and a sufficient quantity of mats, bought by the ship, for the whole cargo. Six working lay-days were occupied in loading; the **port dues** were 3 annas $\frac{1}{2}$ ton. The *Echo* then proceeded to Pondicherry, arrived 3rd May. The amount of cargo proper received was:—

At MADRAS	3,500	Bags Gingly Seed, each 164 lbs. =	256 tons 5 cwt.
At PONDICHERY	2,350	Bags seed, each 164 lbs. ; and	{ 178 tons.
	150	Pockets seed, each 55 lbs.	

TOTAL: Seed, 432 tons; redwood, 17 tons 16 cwt.; ballast 16 to 18 tons; 467 tons.
Stores and water for 150 days.

Draught forward 14 feet 2 inches; aft 16 feet 4 inches; dry side amidship, 4 feet 4 inches.

Pondicherry tonnage dues on 369 tons, $\frac{1}{2}$ 12; lighthouse dues, $\frac{1}{2}$ 23 1; pier duty, 8 annas $\frac{1}{2}$ day; coolie hire, about 8 annas $\frac{1}{2}$ man $\frac{1}{2}$ day; extra for tindal.

353. Seven lay-days were occupied loading at Pondicherry, and she left 15th May. The pockets of seed were for beam fillings, &c., and came at half freight. The ballast, dunnage, &c., were thus arranged:—the stream and mooring chains, &c., were placed in the lazarette to assist in putting her by the stern. Right aft a portion of the ballast was built well up on the floor, and the level gradually lowered as it approached amidships. On the top of that the coarser and heavier pieces of red-wood, generally very crooked, were stowed for dunnage, carried forward, and well up into the bilges, the spaces being filled up and levelled for the mats, with the smaller ballast stones, making the whole firm and compact. The sides were dunnaged up to the beams with the straighter and lighter pieces of red-wood, reserved for the purpose, and stowed close to make weight; all other parts of the hold and 'tween decks dunnaged with light wood as customary. Mats in all cases were placed between the dunnage, iron work, &c., and the bags. When loaded, the hold, lazarette, and sail lockers, were chock full; the two latter were emptied by the seed being passed into the hold, after the cargo became settled by working at sea. She arrived in Marseilles in October, 1869, and discharged in the old harbour:—

Gingly Seed, kilos, 434,276 @ 1,015 kilos, $\frac{1}{2}$ ton	427,100 tons.
Red-wood, 2,803 pieces, kilos. 17,130 @ 1,015	{ 16,100 tons.
kilos, $\frac{1}{2}$ ton.....	
Freight of seed	@ 72s. 6d. $\frac{1}{2}$ ton
Freight of Red-wood.....	@ 36s. 3d. $\frac{1}{2}$ ton
Exchange at Marseilles $\frac{1}{2}$ 25 15 to the sovereign English.	£1,550 19s. 8d. 30 11s. 8d.

354. On comparing this with the manifest at Pondicherry, it will be seen that there was about 4 tons less weight delivered than received, owing partly to wastage when taking in and discharging, and partly through drying in transit. The sweepings and damaged seeds were about 500 kilos. ; the seed was all more or less full of insects, moths, flies, &c., which came on board and left with the cargo. There was tolerable dispatch at Marseilles ; the merchants' stevedore was compelled to receive the bags from the hatchway which was being worked, and to carry them ashore on planks over the bows. The bags, on being landed, were cut open, and the seed emptied and heaped up on the wharf. It was then put in sacks afresh, weighed by sworn weighers, and sent to the warehouses, the Customs' weight being accepted by both receiver and ship ; the officers are shifted every two or three days, making bribery useless. The stevedore's charge on the average is about 16 sous $\frac{1}{2}$ ton, in some cases more, according to the work. The vessel was moored head on to the wharf on the north side, it being then winter time. On the south side ships lay stern on to the wharf in winter, and the opposite in the summer. The same rule is observed more or less in the new harbour, owing to the force of the winds which prevail at different seasons. No fires or light allowed on board. The monsoon having changed from north-east to south-west, it was very difficult getting down the coast although only a short distance, and had Pondicherry been made the first loading port, a month might perhaps have been saved.

355. In 1869, the *Madras Standard* warned masters proposing to load gingelly seed, in the northern ports, for Marseilles, that when the year's crop is unfavourable in quality, and has been collected before coming to maturity, they may be unable to obtain their freight. There is an explicit enactment in the "*Code Maritime*" that the cargo alone is answerable for the freight payable at the port of destination. Gingelly seeds, above all others, if shipped in an unsatisfactory condition, must on arrival be deteriorated to the extent of being calcined or worthless. The shippers will then legally have the option of abandoning the cargo for the freight.

356. GINGER is packed at Calcutta in bags of 1 cwt. each, and is generally used for broken stowage for dry cargoes such as lacs, indigo, &c., and over casks of rum, &c. It is shipped all the year round. Some comes from Cuba. Bengal ton 12 cwt. in bags, Madras and Bombay 12 cwt. in bags, 50 cubic feet dry in cases. A bag of Jamaica ginger weighs about 1 cwt., Barbadoes $1\frac{1}{4}$ cwt., and East India 1 cwt.

357. **GLASS.** Crates of, should be packed perpendicularly by each other and firmly wedged together, so that the glass will not talk or sound when the ship rolls. Keep at a distance from salt or wet, or the straw will rot and breakage ensue. In loading or discharging, hook the crates at each end and not across. When stowing with coal it should be carefully trimmed into the cants or ends of the crates; other goods are preferable, as coal soils the crates. More damage is usually done in receiving and delivering than during the voyage; the outside table is the one most frequently broken. Masters should refuse crates of glass or bottles if the straw is wet, for breakage will inevitably ensue. The specific gravity of crown glass is 2.520, green 2.642, flint 2.760 to 3.000, and common plate glass is 2.760. A cubic foot of crown glass weighs 156 lbs., green 169, flint 187, and plate 170 lbs.

Tonnage, &c. A keel, 850 cubic feet, consists of forty 18-table crates 4½ tons, fifty 15-table 5 tons; or sixty 12-table 5½ tons. A stone of glass weighs 5 lbs., a seam is 24 stone, or 120 lbs.

358. Boxes of **German** sheet should be stowed on their bottoms; about 40 of these boxes go to a keel of 850 cubic feet or 4½ tons weight. **Plate Glass** is packed in cases; the chief cause of breakage arises from their not being stowed with their proper edge up, as marked. When not marked they are safer on their edges than on their flat. Great care must be observed when slinging, especially before the cases are fastened in the slings and when they are passing the combings of the hatchway, in loading or unloading. Silvered glass must be kept off from everything of a damp nature. A superficial foot of plate glass, one-tenth of an inch thick, will weigh 1 lb.

359. **Glass Bottles**, green or black, when laden in bulk on coal, the latter requires to be levelled as smoothly as possible, and the large knobs thrown fore and aft. Place a plentiful bed of straw on the coal and wedge the bottles so that they will not talk when the ship moves. The manufacturer sends an experienced hand to stow the bottles, and the master one of the crew into the lighter, as with earthenware. When empty bottles or bottled goods are packed with straw, it is highly necessary that before signing bills of lading the master should know that the straw is perfectly dry or breakage will certainly ensue.

Tonnage, Freight, &c. 100 gross of quarts, 6 per gallon, 19 lbs. weight per dozen in bulk, 10 tons; 200 gross of pints, 12 per gallon, 11 lbs. weight per dozen, in bulk, 11½ tons; or 80 crates bottles, 10½ cubic feet each, 10 tons go to a keel or 850 feet. When wheat is 1s. ¼ quarter freight bottles 6 to the gallon are rated at 11½d. ¼ gross, and in crates 1s. 2½d.

360. GLOVES, especially those of the finer and more delicate kinds, are liable to injury through dampness even when packed in bales or chests ; see the article bales. A dicker is 10 dozen.

361. GOLD. When shipping at **Melbourne**, and the cargo is nearly complete, the master attends at the different banks daily, at stated hours to see the gold weighed ; after which it is placed in small strong wooden boxes, made for the purpose, holding generally 1,000 oz. each ; they are screwed down in his presence, sealed with his seal, and that of the bank, where the boxes remain until a day or two previous to sailing, when all is taken, at an appointed hour, to a steam-boat provided by the master, and conveyed to the ship. Occasionally an agent attends at the banks and sees the gold weighed and sealed, and otherwise acts for the master, if it is not convenient for him to attend ; but the master, being the responsible party, should prefer acting for himself. As the gold comes over the gangway the chief mate takes the ordinary account, and it is then ranged along the cuddy deck, where it is again counted as it goes down, and also as it goes into the safe ; when deposited and the safe locked, the key is delivered to the master. Usually the most trustworthy officers, petty officers, quartermaster, &c., are selected for this duty ; the seamen are employed in other parts of the ship and aloft. Another authority says, there are two keys, one in charge of the master, the other of the mate, until all the gold is deposited, when the mate's key is delivered to the master, who places a seal on the key-hole, and makes periodical inspections of the safe on the passage home. Agents from the banks come with the gold and present their bills of lading to the master for his signature ; the steam-boat remaining alongside until all is complete, when with the bills of lading signed, they return ashore in her.

362. Where ships are not provided with strong chests, a "stow hole" is sometimes left, in which the gold is placed, and then buried with bales of wool or other bulky goods. The gold ought to be placed where no one but a trustworthy officer has any business to go, and the chests and fastenings should be occasionally examined. On arrival in the London docks, and when alongside the quay, the safe is unlocked, and the gold passed into the cuddy, where it is counted as before. It is then put into a cart or wagon, in charge of the master, whose responsibility does not cease until it is safely lodged in the bank. In **Sydney** also the master or an authorised person from the office of his agent, sees the various parcels weighed, packed, and sealed with the seals of the shipper and master. The bills of lading without the clause "weight and contents unknown," and

bearing in the margin an impression of the shipper's seal, are then and there initialled by the master, so that he may identify them.

363. Some masters, when hoisting money, plate, or other valuables, on board attach to the boxes a buoy having a *buoy-rope* corresponding in length with the depth of the water alongside, so that if anything gives way the box can be recovered. For boxes of treasure strong nets, say of 2-inch rope, are very useful and safer than slings.

364. On the West Coast of **Africa** gold dust is usually packed in bags, or small cases; sometimes four or five bags are packed in a case; in sailing vessels it is often stowed abaft the rudder-case.

365. In conveying Crown Treasure the Admiralty allows for 600 leagues $\frac{3}{4}$ p cent.; above that distance 1 p cent.; belonging to other parties, gold or jewels, under 600 leagues, $\frac{3}{4}$ p cent.; under 2,000 leagues, 1 $\frac{1}{2}$; above, 1 $\frac{1}{2}$; silver, under 600 leagues, 1 p cent.; under 2,000 leagues, 1 $\frac{1}{2}$; and above, 2 p cent. Such freights shall be payable clear of all deduction whatsoever; and it shall be stipulated in the bill of lading, that the captains and commanding officers shall not be liable to any expenses attending shipment, until the same shall be safe alongside; and their liability ceases immediately they have landed the treasure at the destined port. Gold, silver, diamonds, watches, jewels, or precious stones, may be landed on Sundays; see landing. There is an important clause (503) in the Merchant Shipping Act, 1854, which limits the liability of owners, in regard to gold, silver, diamonds, watches, jewels, &c.

366. The following is the rule for estimating the value of diamonds:—square the number of carats and multiply the sum by the selling price of a stone of one carat. For example, supposing the latter to be £8 (the price in 1865), the value of one of five carats would be $5 \times 5 = 25$, which multiplied by 8 gives £200. A perfect ruby of large size is worth more than a similar diamond.

Clause 503. "No owner of any sea-going ship, or share therein, shall be liable to make good any loss, or damage, that may happen without his actual fault, or privity of or to any of the following things; that is to say:—

(1). Of or to any goods, merchandize, or other things whatsoever, taken in or put on board any such ship, by reason of any fire happening on board.

(2). Of or to any gold, silver, diamonds, watches, jewels, or precious stones, taken in or put on board any such ship, by reason of any robbery, embezzlement, making away with, or secreting thereof, unless the owner, or shipper thereof, has, at the time of shipping the same, inserted in his bills of lading, or otherwise declared in writing, to the master or owner of such ship, the true nature and value of such articles.

To any extent whatever."

367. Bill of Lading. Court of Exchequer, 16th June, 1856, *WILLIAMS v. AFRICAN STEAM NAVIGATION CO.*, an action was brought to recover the value of a quantity of gold dust shipped from the coast of Africa. The question raised was, whether the defendants were exempt from liability under the above section, which requires that in certain cases, such as the shipping of gold, the shipowner shall not be liable for loss, unless, at the time of shipment, the owner shall have declared the nature, quality, and value of the article. In the present case the bill of lading specified the shipment of "about 1,100 ounces of gold dust, value unknown." The Court held that the requisites of the act had not been fulfilled by plaintiff, and that defendant was therefore exempt from liability. It might be that the quality and nature of the gold had been sufficiently specified, but it was clear that the value had been left a perfect blank.

Freights, Weights, &c. Bullion is freighted from Bombay @ 7 cent. Gold is weighed in Bengal by the nello 0.28 grains; Pondicherry 0.367 grains; Singapore bunkal 832; Madagascar nanke 5, and vari 30 grains; the value is variable—Bombay 4.475, Anjar 5.6, Delhi 5.63, and Surat 5.859 grains; 100 gousse = 1 tola; Spanish tonin for gold 8.875, and for silver 9.245 grains.

368. GOOD FRIDAY. In France and other countries, where the merchant requires a ship to be laden or discharged on Good Friday, and the authorities of the port do not prohibit it, the ship is liable for refusal, and the ship can claim on the wages of such of the crew as refuse.

369. GRAIN AND CORN. Grain is described as being the small seed of any kind of grass, chiefly, however, cereals, which are the grasses producing bread corn, and are the object of continuous culture for food, as wheat, rye, barley, maize, oats, rice, and millet. Corn is the general commercial name for the grain or seed of plants used for human food. In England the bread corn is chiefly wheat; in the United States the name corn applies especially to maize; in Scotland it is given to oats before they are ground; and in Sweden, Iceland, &c., it denotes barley. Another authority says the two terms corn and seed include all cereal produce except rice. Peas and beans are termed pulse; linseed and rapeseed are seeds; gram is a common name in India for several kinds of pulse, of which for freight 20 cwt. go to a ton. For oats and rice see the articles; for aniseed, canary, clover seed, cole seed, colza, cummin seed, fennigarric, linseed, millet, oil seeds, poppy, rape, teal, &c., see the article seeds.

370. Stowage of Grain. No cargo of which more than one-third consists of any kind of grain, corn, rice, paddy, pulse, seeds, nuts, or nut-kernels, hereinafter referred to as grain cargoes, shall be carried on board any British ship, unless such grain cargoes be contained in bags, sacks, barrels, or secured from shifting by boards, bulkheads, or otherwise. If any managing owner or master of any British ship,

or any agent of such owner who is charged with the loading or sending such ship to sea, knowingly allows any grain cargo or part of a cargo to be shipped contrary to the provisions of this section, he shall incur a penalty of £300; see sec. 22 of Act 1876.

371. **Cost of Grain**, in bulk *versus* in bags. The *Emma and Pulton*, of Ardrosan, 660 tons, loaded 880 tons of Indian corn at Baltimore, U.S., one third of the cargo being in bags, and the other two-thirds in bulk.

The one-third of the cargo in bags , for hire of bags	\$210
Equal to 72 cents per ton.	—
The two-thirds of the cargo in bulk , cost for bulkheads, shifting boards, &c.	\$618
Cost of survey on fittings	20
	<hr/> \$638
Less value of old fittings	90
	<hr/> \$548
Equal to 93 cents per ton	

This vessel loaded the 880 tons in 16 hours, the bags being filled in the vessel from the elevator, she went to sea, the bulk grain settled and shifted; that in the bags and all stowed in the 'tween decks did not move. The vessel went on her beam ends and foundered, drowning part of her crew. This vessel could have been loaded with an entire cargo of bags in three days, a less time than it took to put up the wood fittings, so that she could have been laden quicker and cheaper in bags than in bulk.

372. A due knowledge of the **season of shipment** of such an important article as grain, is of the utmost consequence to a master, especially when it happens that he is in a strange and perhaps distant port, where he may be tempted to load his ship with some other goods at a comparatively low rate of freight, under the impression that a cargo of grain can be readily obtained at the port of discharge. Generally speaking, grain may be shipped all the year round, but this statement is likely to lead an inexperienced person into difficulties. Although it is true that grain is an article which can be shipped at all seasons, and is shipped from certain ports, called open ports, more or less throughout the year, yet the quantity must be governed, to a certain extent, everywhere, by the season of the harvest and by the amount produced. There are, however, other causes which possess great control over shipments; the chief one is the closing of certain ports by ice in the cold season. Another great governing cause is the state of the markets. After a wet

harvest or gathering time, grain may be quite unfit to ship unless kiln-dried, or after the winter.

373. **Baltic shipments** from Riga commence when the navigation opens in May, and continue to its close in October. Petersburg and the other higher ports close earlier and open later than the lower ports. The navigation at Cronstadt (Petersburg) is not open until June and closes in November. Archangel shipments are made only during the summer months, say June, July, and August.

374. **Ballast Regulations at Riga.** To the Secretary of the Board of Trade, Marine Department, London. Sir,—I have the honour to forward for the information of the Lords Commissioners of the Board of Trade, a copy of regulations for masters of vessels arriving with ballast, and proceeding up the river to this port. The regulations have recently been published under the authority of the Exchange Committee in this city, and have been framed and settled by that body. It is to be remarked that the payment for discharge of ballast is imperative on all vessels at the rate mentioned, even though they may not have any on board. Under the existing scale, a vessel of 200 tons register burthen is made to measure 140 Riga rye lasts, and of this latter quantity one-third, or 47 lasts, would be assumed as the amount of ballast. I have many complaints from masters on the subject of this arbitrary mode of calculation, and I shall probably be obliged to address you again on this subject. I am, &c. JAMES GRIGUON, *Consul*, British Consulate, Riga, 18th July, 1869.

375. **Stettin.** NOTICE.—The grain exporters of Danzig, Königsberg, Memel, and Stettin, have resolved to adopt the following scale of rates:—peas, tares, beans, and wheat, per delivered 500 lbs. English weight; rye pays 2 $\frac{1}{2}$ cent.; linseed, barley, rape, and hempseed 5 $\frac{1}{2}$ cent. additional freight.

376. From the **Danube, Galatz, and Ibrail**, exports take place usually from April to December inclusive; the Sulina mouth of the Danube is open longer. The Sea of Azof is similar to the Danube. The port of Odessa is usually frozen for two months between December and March; in mild winters there is no ice in the port. In the Delta of Egypt, wheat and barley are quite ripe in May; the produce of the field there arrives at maturity generally a month later than in Upper Egypt. Durrah (*sorghum vulgare*), the grain on which the natives chiefly subsist, and millet, are sown later and gathered earlier. There is no winter, so to say in Egypt; the seasons are governed by the state of the Nile, and are therefore, the inundation, spring, and harvest. The maximum rise of the Nile occurs about

the second week in September ; by the middle of November the river has returned to its old bed. Wheat grown on the banks of the Nile is usually so dirty as to require to be washed or cleaned. The Egyptians pull up the straw, roots and all, which is trodden by oxen to beat out the grain. The earth and stone is estimated at about 4 ¢ cent., but this loss is in some measure compensated for by the extreme dryness of the grain which in washing absorbs 4 ¢ cent. of wet. Barley is frequently mixed with wheat. The wheat is very white but is seldom brought to England unless prices range high. There are patent machines for cleansing this kind of produce. Exports from Alexandria take place chiefly in November, December, and January.

377. In **New Brunswick**, oats, wheat, and other cereal grain are ready for the sickle in September, and are generally secured before October. The average interval between the earliest sowing and latest ploughing, or mean length of summer, is 6 months 22 days. The best wheat grown in Restigouche weighs sometimes 65 lbs. ¢ bushel ; barley 56 lbs. ; black oats, 40 lbs. ; and white 47 lbs. ¢ bushel. In **Eastern** (lower) **Canada** the mean range of the thermometer for June, July, and August, is $77^{\circ} 57'$; for the winter months $11^{\circ} 25'$. In **Western** (upper) **Canada** $77^{\circ} 37'$ and $22^{\circ} 49'$. The ports of **Quebec** and **Montreal** are open from May to October and November. Montreal is the chief port of shipment during the above periods, but when ice closes its navigation, grain, flour, &c., is conveyed by rail, either to Portland or to Boston for shipment.

378. Between the months of November and April, when inland navigation by lake and canal is usually closed, the shipments of grain from **New York** are not extensive ; considerable quantities are then brought to the city by rail coastwise. About the end of April and the beginning of May, dealers are very busy, and by the middle and end of May ocean shipments commence. Canal navigation to New York is generally closed in the first week in October, but sometimes not until the middle of November ; and is opened in May or earlier, if practicable. The navigation by canal is very extensive, and in order to prevent canal boats, &c., from being frozen in, it is necessary that all should be out before the gates are closed ; this practice involves an occasional loss of several days ; each end is closed on the same day.

379. **Philadelphia**. The following is a copy of a certificate issued 1st March, 1862, by the Marine Surveyors of Philadelphia—No. 293. The Norwegian brig *Sterna*, of Arandal, $300\frac{1}{10}$ tons, bound hence to Cork for orders, with the following cargo—wheat and flour.

This vessel has on board 12,022½ bushels of grain in bulk, not exceeding one-half her register tonnage, three tons and.....bushels of grain in bags, all well and properly stowed. The balance of her cargo consists of 370 barrels of flour. The bins are well constructed, they are all ceiled throughout, the floor is double laid, the bulkheads are well secured, has shifting boards both sides of her deck, stanchions from the lower deck down to her keelsons, the pump-well is sufficiently large for a man to get down the same should the pumps get choked, a passage way into the pump-well is secured by a hatchway in both the upper and lower decks of the said vessel, near the pumps. The brig draws 13 feet 6 inches water, is not overloaded, and in our opinion is in a seaworthy condition.

380. In the Western Province of the **Cape Colony**, during the winter months (June, July, and August) the prevalent winds are from north and north-west, and south-west, and are generally accompanied by rain; the north-west wind is dangerous to the shipping in Table Bay. South and south-east winds usually prevail during the summer months (December, January, and February), which often bring rain in the Eastern division of the Colony. In Cape Town, wheat is usually brought to market in the months of January, February, and March. Much speculation occurs at this period in the purchase of wheat for the purpose of storing for re-sale at the close of the year, prior to the arrival of the new wheat in the market. The export of wheat is very small; it goes occasionally (with oats) to the Mauritius. Large quantities of wheat and bread stuffs are received annually from Van Dieman's Land, Bengal, and from America and California in the shape of cask flour. Some fine white wheat from the Cape has weighed 62 to 63 lbs. $\frac{1}{2}$ bushel.

381. In the **East Indies** the south-west or rainy monsoon extends from May to October. The north-east or dry fine monsoon blows from October to May. The principal time for shipping old seeds is during the latter end of the rains, about October. East India wheat is very susceptible to weevil from its dry nature and the heat of the climate; it is rarely brought to England.

382. In **Australia**, according to one authority, summer extends from 1st December to 28th January; mean heat 80° at noon; the autumn is in March, April, and May. Another authority says, in South Australia the summer months are November, December, January, February, March, and April. February is the hottest month. On the plains of South Australia the wheat harvest commences in November, but in the hilly districts not until December or the beginning of January. At **Adelaide** the harvest is in January;

the chief exports thence are made two months later, say in March, chiefly to Melbourne, Sydney, and the Mauritius, both wheat and flour; a ton is 45 bushels; the flour is considered the best in Australia. Wheat from Australia to England forms usually only a portion of the cargo; it is generally in bags, stowed near a hatchway which is opened in the tropics to let off the damp air generated on the passage to Cape Horn. In **Tasmania** summer commences about November, autumn in February, winter in May, and the spring about August. December 21st is the longest day. At Christmas the thermometer in the parlour frequently stands at 70°. By the Colonial law a market bushel of wheat is fixed at 60 lbs.; it frequently weighs 65 lbs., and sometimes 70 lbs.; by the same law oats are bought and sold at 40 lb. to the bushel; they have weighed 49 lbs. In **New Zealand** spring begins in August, summer in November, autumn in April, and winter in June. The days of summer are two hours shorter, and of winter two hours longer than in England. At Auckland the mean temperature in January is 69° 3', and in July 49° 5'. New Zealand exports potatoes. Tasmania exports grain and potatoes to the other colonies. Victoria and New South Wales import grain, &c.

383. At **San Francisco** the wet season extends from the middle of November to the middle of May; the dry from the middle of May to the middle of November. The dry season commence earlier in the South and continues longer. In summer the temperature sometimes reaches 110°; in the rainy season it seldom falls below 40°. San Francisco wheat, white especially, is generally of a very fine quality and of good weight; samples of two seasons from consignments to England weighed each 65 lbs.

384. The wheat harvest on the west coast of **South America**, that is for Chili, is in February, and the principal shipping ports are all south of Valparaiso, viz.: Constitucion, in the river Maulé, Tomé, Penco, Lirquen, and Concepcion in the bay of Talcahuano; these latter places also supply the bulk of the flour to all parts of the west coast. There is little or no flour shipped at Valparaiso itself, unless transhipped, as all the mills are in the neighbourhood of Concepcion. A fine description of red wheat is shipped at a place called Tscapilla, between Valparasio and the river Maulé. Chili wheat is very dry and weighs heavy per bushel, but it is liable to weevil, especially on long voyages.

385. **MAIZE** in the United States, is planted about the middle of May; in Mexico the seed time is from 15th June to 31st August. In warm climates **MILLET** is usually sown in May and June.

386. As the **freight** of grain is in many cases governed by the *weight*, it is very necessary that masters should ascertain, before chartering, if possible, the weight of the cargo offered. This can be ascertained by a knowledge of the average weight of a bushel; the table of weights per bushel which is at the close of this article may be useful. The duty on grain and pulse is now levied in England on the weight, and not by measure as formerly; there is a tendency to charge freights by weight also, the quarter being reckoned at from 480 to 504 lbs. All American and Canadian wheats are freighted at 60 lbs. ~~per~~ bushel. The Admiralty buys at that rate, refuses all below 60 lbs., and pays additional for the overplus. There are eight bushels in a quarter.

387. The stowage of 100 quarters of wheat is considered as about equal to 21 tons of coal; this is at the rate of 4½ quarters to a ton; 4½ quarters is a safe calculation for ordinary ships, reckoning wheat at 60 lbs. per bushel. A good carrying ship will stow 50 to 60 quarters barley to every 10 tons dead-weight. Taken as a dead-weight cargo the quantities of grain which can be carried by various ships of certain stated dimensions, are recorded incidentally in this work, under the heads of several different articles, for which see the index. Further information hereon will be found towards the close of this article.

388. Before engaging to load, a master should consider if his vessel is qualified in all respects to take grain. Where doubts exist every effort should be used to remedy the presumed defects. It is not sufficient that she should be what is termed "tight, staunch, and strong;" for if built or repaired with any timbers or planking liable to produce an injurious steam when saturated, or liable themselves to steam when heated by grain, the consequences will be very unsatisfactory. It is in part for this reason that ships built of iron are occasionally preferred. A vessel, the hull of which is pickled, or which has recently discharged salt, &c., or one the ceiling of which has just had a coating of varnish or tar, is not well qualified to receive grain. The effects of bilge-water are most insidious and pernicious with such cargoes, as with tea which see; and the mischief is increased by the introduction of loose grain into the limbers, where decomposition creates an exhalation of a very offensive and detrimental character; this liability is increased by rats, which sometimes "eat" holes through the ceiling; the pumps are likely to be choked by this or other means, and should be well protected. The heels of the pumps should have nailed round them with a few tacks lightly, some coats of tarpaulin to prevent the grain from

falling into the limbers. Under the heading, guano, there are some remarks on the effects of grain cargoes on the holds and hulls of ships.

389. The **Decks and Waterways** should be perfectly tight before loading, and kept so by throwing water over them; more injury is done by a small leak here than by a large one elsewhere; for although considerable leakage occurs in the hull, yet if the pumps be regularly attended to, the cargo remains uninjured, whilst a pint of water, or less, weeping through a deck seam, may commence the heating, and lead to the damage of the entire cargo. The water which falls, penetrates through the surface to the keelson, in a direct line, and dampness is radiated from it in every direction. When it is necessary for a ship to lie some time in harbour exposed to the sun, her deck planks rend and open, and the seams become dry; they should be well caulked, not omitting that part under the cook's galley; see mate. The decks should also be staunched with water once, at least, before sunrise, covered with an awning during the day, and wetted again once, at least, after sunset. It may be observed that the decks of ships in which this practice is omitted, become staunched by sea-water sometimes during the passage home, where they exhibit no evidence of deficiency of attention, although their cargoes may be in a very discreditable condition. The **topsides** require equal attention; they should be skidded, and protected all day with old canvas, mats, &c. Some vessels, foreign-built especially, have combings to their main hatchways not high enough to keep out the wash of the sea when they heel over; from the ordinary rise or sheer of ship's decks, their fore and after hatchways are less exposed.

390. An experienced merchant considers that vessels of a small size are much safer than larger ships for the conveyance of a yielding cargo like grain. He cannot remember having seen a cargo of more than 3,000 quarters undamaged after a winter's passage. Vessels carrying from 800 to 1,200 quarters, are the safest. Large vessels strain more, and more frequently become leaky. It is stated that there is a prejudice in the minds of underwriters and Insurance Companies, in favour of large ships.

391. All corn, wheat, rice, pease, beans, &c., when in bulk, according to Messrs. CHAPMAN, of Liverpool, should be stowed on a good high platform or dunnage of wood, of not less than 10 inches, and in the bilges 14 inches; the pumps and masts cased, to have strong bulkheads, good shifting boards, with feeders and ventilators, and to have no admixture of other goods. Flat-floored, wall-sided ships should be fitted with bilge pumps. On no consideration must the stanchions under the beams be removed.

392. The custom in some ports, more especially in those of the Mediterranean, is to cover the dunnage of a cargo of grain with a large quantity of mats at a very heavy expense, and frequently to the injury of the cargo. **Mats** are often laid three deep, and when wet, either through neglect of the pumps or from other causes, commence rotting immediately, and extend their damage to the surrounding cargo, which is injured much more than if the grain had received wet which had not been in contact with the mats.

393. **Shifting boards** in a green state, and all other stowage wood in that condition, will injure grain near. Cargoes from the Baltic and Montreal, of excellent quality, became damaged on the passage, and the dampness of the shifting boards appeared to be the only cause.

394. In vessels constructed with caulked ceilings, **dunnage** will probably do more harm than good, as there is always a doubt about its being perfectly dry. It must however be observed that these vessels are liable to damage their cargoes by "heat from natural causes," in consequence of the retention of the steam through deficient ventilation; and where there is probability of leakage, good dry dunnage will be necessary to protect from any wetness which may lodge on the ceiling and be unable to escape in consequence of its tightness.

395. In **mixed cargoes** it is desirable that grain, whether in bulk or bags, should always be stowed in one distinct compartment. However dry grain may be apparently, when shipped, it may sweat on the voyage, and damage other goods which may be stowed near; this is particularly the case with flour, whether in barrels or sacks. Several instances have occurred where flour from America, France, and Spain, has been seriously injured when stowed in this way, and the injury has been attributed to the grain; it must, however, be remembered that flour will heat and turn sour when stowed by itself. Moist goods, salt provisions, cotton, &c., are liable to the same injury. The exhalations from a cargo of Quebec timber are injurious both to grain and flour stowed on it; they become heated and discoloured by contact with spelter. A **partial cargo** should be covered with a layer of stout dry shifting boards, on which strong temporary stanchions should be fixed with their upper ends secured against the deck beams. With **Grain in lots**, for different consignees, it is absolutely necessary to keep each separate by bulkheads, compartments, or mats, &c., or disputes and loss of freight will occur in discharging.

396. **Short Delivery.** *WOODWARD v. ZERIGA.* Plaintiff is indorsee of a bill of lading for 2,932 bags of wheat, viz.: 2,464 marked C, and 468 N, part of the cargo, and shipped under the usual bill of lading. The *Arctic* was a general ship, and there were other consignees of other portions, consisting also of wheat in bags. To each of those were delivered the number of bags to which he was entitled, and a portion of the loose corn. The remainder was to a considerable extent mixed with resin and other impurities, and approached the amount of 50 bags, which was tendered as and for the 50 bags now claimed, which had been short delivered to plaintiff; the master stated that the bags had burst, and that he could not deliver them, though fragments were produced of about the number missing, but in such a state that plaintiff's marks could be traced only in about 26 cases. The loose wheat could not be identified as that which had come from plaintiff's bags, nor from its condition, or even similar to it, according to the evidence of defendant's witness, and the judge inferred as a fact from the evidence, that it was composed of the mixed waste from the whole cargo, containing, no doubt, a portion from the bags in question, but mixed with grain of the other consignees, the waste in whose portions was also considerable, amounting in one case to from 3 to 3½ ¢ cent. This grain plaintiff refused to receive as and for the 50 bags, though, with a view to an arrangement, which it appears fell through, he received and sold it on ship's account. On these facts, it was held that the plaintiff was entitled to a verdict, that the usual clause as to breakage and leakage in the margin of the bill of lading did not apply, and that the delivery of the loose grain in question was not shown to be the plaintiff's, and in point of fact, was necessarily, and to a great extent composed of other and different grain, and was not a compliance with the terms of the bill of lading. [For *Julia's* case, short delivery, see oats.]

397. It may be taken for granted that **Fermentation** and heating of grain cargoes, however long the voyage, will never take place without the presence of moisture; for in the case of hard *Taganrog* wheat in a perfectly dry state, if free from weevil, it may remain for an indefinite time without injury, provided moisture be entirely excluded. But there is always a dampness about the hold that in time will have some effect in producing damage which increases after once commencing; at first slowly, but at each step more rapidly than the one previous. When fermentation does commence, and a portion of the cargo begins to heat, a vapour will arise, and be condensed against the upper part of the deck, whence it falls back in drops on the grain, and so increases the damage. If a master supposes that his cargo has been wetted, either in the bilges or by leakage from the deck, he cannot err by ventilating as much as possible, even though there may be weevil in the cargo; for although ventilation may cause the weevil to increase, the damage thereby will probably be less than by the additional fermentation and injury from condensed moisture, if ventilation be neglected.

398. It may be inferred also that there is considerable moisture in all new grain, unless it be the produce of an exceedingly dry

climate ; this moisture is not apparent, or sufficient to cause damage during short voyages ; the exterior may appear perfectly dry ; but on biting, a degree of toughness and mealiness is apparent. When grain is brittle, approaching to rice in its character, it will sustain the longest voyage uninjured.

399. Where grain sustains damage from moisture, at first it swells, fermentation then takes place, organic matter is decomposed, gases are evolved, and heat is produced. The vapour condenses, as previously stated, against the deck and sides, which from water washing over them, are cool enough even in warm latitudes, especially during the night, to produce this effect. While discharging a **fermented cargo**, ventilation should be maintained, working or not, or the injury will be greatly increased. It is always desirable to import wheat into Great Britain during the winter months. When the voyage is made in the summer, unless the wheat is very superior, and is shipped in exceedingly good condition, it is almost sure to become heated ; soft wheat is especially liable, and more so when damp. In cargoes heated, the upper part is always most injured, because that part suffers from the aggregate heat of the entire cargo.

400. The Sunderland Shipowners in their report, January, 1863, say "A difficulty has arisen from nine out of ten grain cargoes being more or less heated, not in consequence of sea damage, but because they are shipped moist. Heating they swell, and objections are then taken to the quantity discharged being ascertained by measure, because it is said that the merchants pay freight for bulk, not of good dry grain, but of deteriorated, heated, and swelled grain. In the comparatively few cases in which the deterioration arises from some fault in the vessel, the shipowner has no cause to wonder at the merchant's dissatisfaction. When the damage arises from the grain being shipped in an unfit condition or from storms and casualties of the voyage, it is unfair to attempt to fleece the owner of his full freight."

401. **Increase of measure**, generally, is caused more by the roughness of the grain, which prevents it from fitting so closely into the measure, than by any actual increase in bulk of the grain itself ; therefore a damaged or heated cargo may have settled into a hold when sound, and although apparently the vessel be not full on arrival, yet on measuring out the cargo, it may be found increased in measure, according to the nature of the grain and the damage sustained, from 3 to 7 $\frac{1}{2}$ cent. or even more ; so that the cargo could not be put into the same vessel again unless brought back to its original good condition and weight per bushel, when it would be found to have

decreased in quantity 3 or 4 $\frac{1}{2}$ cent. or more. But the portions of a cargo which are actually wet will, on kiln-drying, decrease in the proportion of 4 to 3 (25 $\frac{1}{2}$ cent.) or occasionally a greater loss will be shewn in quantity.

402. One of the most frequent causes of dispute between masters and consignees, is the difference of quantity between that stated on the **bill of lading** and that delivered; the difficulty is increased through the uncertainty of the cause. In the first place, as will be seen in a table which follows, the weight of grain is not uniform in all parts, and it varies with the seasons; next there may be a discrepancy in the weights or measures, foreign especially, for which reason a copious table is appended; but the principal source of dispute is from difference of bulk by leakage and fermentation. Fermentation has been previously referred to; it may occur from deficient dryness before shipment, natural fermentation on board, or that created by the unsuitableness of the ship.

403. Freight must be paid according to **charter-party**; the remedy for improper stowage or neglect, is against the master and owner, by action. A master informs the *Shipping Gazette* that his ship arrived from the Mediterranean with a cargo of wheat, half of which was damaged; the merchant refused to pay freight without deducting half freight for the damaged part, and asks the law of the case in the absence of any clause in the charter-party bearing on the question. The editor answers, 12th July, 1856. "Any claim for deduction of freight, on account of damaged cargo, must depend on the manner in which it became damaged, whether through any default on the part of the ship or neglect of the master, &c. Under any circumstances, however, the merchant has no right to deduct what he considers proper from the freight, although it is often done upon the plea of custom or usage of the port; but before this plea can be received as a valid one, the custom must be proved, and shewn to be one within whose compass the shipowner can be included. The best course for a master to adopt is to receive, under protest, the proportion of the freight offered, and after proving, by means of a survey, that the ship is not liable for the damage or for the deduction made from the freight, proceed against the merchant for the remainder;" see usage.

404. Some charter-parties have the following clause: "It is further agreed that should the cargo consist of wheat, seed, or any other kind of grain, in the event of the cargo, or any part thereof, being delivered in a damaged condition, the freight shall be payable upon the invoice quantity taken on board, as per bills of lading, or

half freight upon the damaged portion, at the master's option, provided that no part of the cargo be thrown overboard, or otherwise disposed of on the voyage."

405. Charter-parties generally contain a clause to this effect: "After true and faithful delivery (all and every the dangers and accidents of the seas, rivers, and navigation always excepted), freight shall be paid at the rate of....." Some corn merchants allege that masters and owners are always ready to avail of this exceptional clause to protect themselves if the cargoes be damaged or some be thrown overboard on the passage, but they nearly always endeavour to obtain freight for the quantity delivered, although that quantity may be increased by an accident incidental to the voyage, and, therefore, excepted by the charter-party. It is usual for ships ordered from a port of call, say Queenstown, Falmouth, or Plymouth, to have an addition of 10 p cent. on their freight for discharging on the Continent between Havre and Hamburg. It has been suggested that vessels ordered to the West Coast of Ireland should have additional freight also. This might be stated in the charter-party.

406. On the subject generally of **bills of lading**, a corn merchant observes that the law is not very satisfactory as to the security in such documents to the holders, for serious deficiency of quantity often occurs, and may be in part attributed to the masters and mates being less careful than they should be in examining weights, and keeping an account of the shipments. When a deficiency arises, often £20 to £50 in value, the master refuses to pay for it out of freight, yet the owner or consignee actually pays for the alleged quantity as by bill of lading, as it is on the faith of that document, as on a bill of exchange, that the money is advanced. In some cases masters try to evade the responsibility by signing "weight unknown" at foot of bill of lading. This does not even meet the case, for the bill of lading represents a certain quantity, and for that quantity the purchaser or consignee advances the amount stipulated. If the bill of lading be transferred through various hands and purchasers, several times before the arrival and discharge of the cargo, the difficulty of "trying back" is great, and no redress may be had. The law is not so clear as it should be on these points, and amendments are essential to the safety of merchants and shipowners.

407. Wheat is frequently chartered by weight, at so many pounds per bushel. Merchants sometimes allow half p cent. for decrease of weight of wheat from French ports in the Bay of Biscay and the Channel, to English Channel ports. Spanish wheat, being

reaped in very dry weather, is said to increase in weight when discharged in Great Britain. It is recommended that masters should always have a few weights correct by standard, to test the weights, beams, and scales used when loading; the practice is general at Liverpool and in the Irish ports.

408. It is advisable not to sign for both weight and measure; and when masters sign for weight they should insist on shippers putting on board the weight per bushel signed for, and refuse all of a less weight, and see the cargo weighed, if possible, on board. On discharging, particular attention should be paid to the measuring; much depends on the meter. An experienced master recommends chartering at $\text{£} \dots \dots \text{lb. } \text{£}$ bushel, weighed as it goes over the side, as being the most satisfactory course for all parties.

409. **Irish Ports.** In some ports on the West Coast of Ireland it is the custom when loading ships to weigh all grain on board, standing beam, three sacks at a time, with 2 lbs. allowance for beamage. Sometimes there is no allowance. On delivery at Liverpool one sack is weighed at a time. Masters should be well advised hereon, and where no allowance is made for beamage, they should protest against the weight signed for, and protect the ship by a formal declaration as to delivery of all the cargo taken on board.

410. When discharging, in some ports, it is the practice of labourers in the hold, to tuck their trowsers up to their knees; instances have occurred where grain has been concealed in the folds, and considerable quantities have thus been purloined from the cargo and carried ashore. At the Ipswich assizes, 6th August, 1864, GEORGE AMOS, seaman of the *Monarch*, was sentenced to three months' imprisonment for stealing wheat. The cargo was shot down from the wharf into the hold where the men stood below with shovels to stow it. The prisoner, and others, had their trowsers tucked up high enough to form a receptacle for the wheat as it fell, and on their return from the ship they shook out their trowsers and gathered up the droppings and carried them off as sweepings.

411. In the **Mediterranean** trade, dunnage say 6 inches on the ceiling and 9 in the bilge. Mat the dunnage and sides, and dunnage or mat all iron, stanchions, &c. To prevent cargo from shifting, there should be suitable bulkheads and shifting boards, perfectly dry, well stanchioned off the side, and well plated with good cleats, to keep them from working out. Care should be taken to fill up to the deck between the beams; for a hold filled on leaving port, will sometimes be found, through settling, only seven-eighths full on reaching its destination; this will show the necessity of particular attention

to the above. If the upper part of the cargo is in bags, the chance of shifting will be decreased; barrels of grain will work through to the keelson, if the cargo is not previously covered with old sails, &c. Some full-built vessels sail by the head if fully laden, and require a baulk forward, that is a bulk to cut off the fore end of the hold. A perpendicular bulk is liable to be smashed—the heel further forward than the head is better; it should be crossed with a plank having stanchions against the pall or forecastle beams. A few dry casks will be found very useful here. A master is not bound to take as much as can be placed in the hold, but as much only as his vessel can reasonably “stow and carry.” Egyptian wheat possesses a very dry flavour, somewhat similar to kiln-dried wheat. The larger portion shipped to England consists of white wheat, a fine bold berry, but light, and not valued by millers, as with few exceptions, from being threshed on the ground as well as imperfectly cleaned, it has a considerable proportion of dirt, seeds, &c.

412. Wheat from **Odessa** for Great Britain, in sailing vessels, should be shipped in the winter, in consequence of the time ordinarily occupied on the passage. If shipped in the summer, unless of a very superior quality and in good order, it is almost sure to heat, and it is said, sometimes requires to be dug out of the hold. This depends on many circumstances; and often all the shipments made during a season arrive in good order, whether laden in the summer or winter; the nature of the harvest has to be considered. It frequently happens that lighters left in charge of vessels whilst loading at Odessa, meet with injury; in that case the owners of the lighters apply against the ship and recover. In nearly all cases loaded vessels, before attempting to cross the Sulina bar of the Danube, reduce their draught by discharging part of their cargoes and taking it on board again after having passed the bar; the grain is thus greatly exposed to rain or a damp atmosphere, and to the spray of sea in stormy weather. It is much preferable to load where the cargo can be put right into the ship. Black Sea wheat and other Eastern grown wheat is frequently brought to Trieste, Malta, Marseilles, &c., and shipped at said ports for England and elsewhere. At the close of this article will be found the Report of the Committee, March, 1863, on the Mediterranean and Black Sea freights. The barque *Kallibrookka*, which belongs to Liverpool and registers 318 tons, is 108 feet long, 23 feet broad, and 18 feet deep, has a sharp bottom, and could take 3,000 quarters of wheat. Her usual cargo of Black Sea wheat is 2,300 quarters, when she draws 17 feet forward and 17 feet 4 inches aft. She has had in 2,850 quarters of barley,

47 lb., and 3,030 quarters of oats, 44 lb. to the bushel. With 480 tons of railway iron, she draws 17 feet forward and 18 feet aft.

413. Cargoes of **Indian Corn** from the **Danube**, and of wheat from Egypt, are battened down and every aperture closed, to prevent the increase of weevil, which cannot exist without air. Their ravages are greater on the surface of a bulk of grain than in the interior, where the air does not circulate so freely; turning will, therefore, in such cases do harm. Indian corn from America is more liable to heat than that from the Black Sea, which is drier. Black Sea and Danubian Indian corn is kept nine months before shipment, as it only comes down in May and June; whereas American is shipped more immediately after harvest, and often has not been properly matured by time or frost, and become sufficiently dry. French maize, shipped before February, is sure to become hot on a voyage, and is often scarcely safe until March or April. Indian corn does not shrink by heating; it expands and gains in measure, and loses in weight the same as other grain. Eight working days are considered a fair allowance for the discharge of 3,000 quarters of Indian corn. The freight is the same as for wheat.

414. **Freight—Barley.** An owner addresses the editor of the *Shipping Gazette*, 23rd August, 1861.—A ship from **Odessa**, receives a cargo of barley, which the merchant describes in his bill of lading as so many chetwerts or about 3,200 quarters. The master signs bill of lading, "measure and quality unknown;" and this bill of lading states, "freight, &c., to be paid as per charter-party." The charter-party stipulates that the receiver shall pay on per ton delivered. At the port of delivery the ship discharges 3,377 quarters, not above five or six of which are in a moist or sweated state, although the whole cargo was very warm but perfectly dry, and rather presented a slightly charred appearance on some of the grains. The receiver now wishes to pay on the bill of lading quantity, alleging that the cargo has swollen. To this the master demurs, and states that he had no knowledge of it nor was he accountable for the quantity shipped, and that his charter-party states that he shall be paid for delivered cargo, without any further stipulation whatever. Can the receiver deduct the freight of the 177 quarters apparent increase from the master's account? How should he settle? Answer: the master should receive under protest the freight offered, and both parties would do well to settle the dispute on the spot by the arbitration of two competent men, one appointed by each party, with an umpire mutually approved of, whose

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award should be binding. If properly managed the arbitration may be completed in an hour and the dispute settled at once.

415. **Barley.** In April, 1867, an Italian vessel discharged at Bristol a cargo of barley from **Kustendje**, of 20,824 imperials bushels, which weighed 22,740 bushels of 50 lbs., giving an average of nearly 55 lbs. Φ imperial bushel; the usual average weight of (Danube) barley being 48 lbs. Φ imperial bushel. It is stated "that the Danube and Black Sea Railway Company have contrived a method of sifting and cleaning barley, which clears it of edge, beard, and shell; the weight then equals almost that of wheat, but the vessel received 15 Φ cent. less freight than for wheat," according to the Baltic Scale. Masters, when chartering, should therefore secure a higher rate for sifted barley.

416. **Barley—Ibrial.** In the County Court, Lynn, 20th September, 1862, Capt. GROVETTO, of the Italian brig *Ligure*, sued Mr. GREGORY for £23 6s. 8d., chiefly for additional freight at 8s. 8d. Φ quarter, on a cargo of barley, consisting, as per bill of lading, of 567½ kilos, equal to 1,397 quarters. It measured out 1,463 quarters. Barley heats and swells during a long voyage. The judge decided in favour of the merchant.

417. **Freight—Rye.** A master writes the *Gazette*, 3rd September, 1862: A vessel from **Taganrog** arrives at Antwerp, the bill of lading stating as follows: 3,518 chetwerts, 7 puds, and 20 lbs. of rye, of 10 puds per chetwert, in good condition, freight payable as per charter party, as well as all other conditions. The charter-party states that the freight is at the rate of 60/- Φ ton tallow, all other goods, grain, or seed, in proportion thereto, according to the London and Baltic printed rates of freight, and another clause that the master has the liberty either to receive half freight on the damaged portion of the cargo, or as per quantity taken on board, as per aforesaid bill of lading. The cargo was discharged in almost an entirely heated condition, and the master claimed freight as per bill of lading, reducing, according to the Taganrog rates of freight, the stipulated chetwerts taken on board, into quarters at the rate of 80 quarters per 100 chetwerts rye. The merchant refuses to pay the freight in this manner, but as follows: by reducing the stipulated chetwerts into kilos, at the rate of 16 kilos per pud, and to reduce those kilos into hectolitres, at the rate of 70 kilos per hectolitre, and the hectolitres into quarters, at the rate of 29 hectolitres per 10 quarters. The editor answers: the master is right; half freight on the damaged portion means damaged by sea-water, when the grain so damaged would be much swollen; but merely "heated corn" is not so included.

418. Owners are not entitled to the freight caused by **increased bulk** from the effects of sea water, beyond the measure at the port of shipment. The *Gloucester Journal* of 20th January, 1855, gives in full the judgment of the Court of Exchequer, in the case *GIBSON v. STURGE*, resulting in the rule obtained in the Easter term previous, being made absolute.

419. This was an action to recover £44 11s. 5d., balance held to be due for the freight of a cargo of wheat from Odessa to Gloucester, in the *Prompt*, bill of lading, dated 28th September, 1852, "shipped, &c., 3,700 chetwerts of wheat in bulk, to be delivered," &c. By a memorandum in the bill of lading, the quantity and quality were declared to be unknown to the master. The provisions in the charter-party as to the freight, was that it was to be according to London Baltic printed rates. At Gloucester, the wheat was 2,782 quarters by custom-house measure; plaintiff claimed freight thereon; defendant tendered for 2,664 quarters specified in the bill of lading. Freight was paid thereon, and an action brought for the larger quantity. At the trial, the jury found as a fact, that at Odessa it would have measured only 2,664 quarters, but there was no evidence whether the increased bulk arose from its bad condition when shipped, from the heat almost necessarily arising in a cargo on so long a voyage, from shipment of water by peril of the sea, excepted against in the bill of lading, or from bad or defective stowage, or careless or negligent conduct of the master and crew. A verdict was entered for plaintiff, leave being given defendant to move to enter a nonsuit.

Mr. Baron MARTIN said: It was argued that the bulk which was delivered beyond the bulk shipped, was water and not wheat; but there was no evidence that any water ever came in contact with the wheat; and, I believe, there are causes which increase the size of grain, other than contact with water. However this may be, in my judgment the measurement for the purpose of freight, wherever made, ought to be of the grains of wheat as they actually exist. The valuable part of the grain is that which produces the flour; but in the grain there is the husk, and, I believe, always a certain quantity of moisture, or water, which can only be removed by the kiln or artificial drying; and this argument, if well founded, would equally exclude the measurement at Odessa, for there can be no doubt that a certain quantity of damp or moisture was in combination in the grains of wheat, and to some extent increased its bulk. It is clear, according to the general law, that the circumstance of the wheat being damaged does not at all affect the right of the plaintiff to freight. It has been decided, that when the entire quantity was delivered, the shipowner was entitled to the full freight, notwithstanding it was proved that the goods conveyed had been damaged by the crew, and that the remedy was by a cross action. It may have arisen from the bad and defective quality of the wheat when shipped. The master expressly declared himself to be ignorant of its quality, and declined all responsibility on this head. The wheat, as was proved at the trial, was shipped whilst the vessel was in quarantine, in an open roadstead, out of barges; and it is notorious that in many foreign parts this is the usual mode. Under such circumstances it is practically impossible to measure a cargo of grain; there is neither time, nor, generally speaking, a sufficient number of men competent to do it. I am quite aware that this rule would hold out a temptation to shipmasters to wet such cargoes, and thereby increase their bulk, but this would

be a most dishonest act, and subject them to an action for damages. In my opinion the plaintiff is entitled to judgment; and the rule ought to be discharged.

Mr. Baron PLATT: It seems to me this rule ought to be made absolute, and that it was the duty of the master to ascertain at the time of loading, the quantity he received; the difficulty seems imaginary, as it can hardly be supposed that the number of cubic feet which his vessel can stow away, could be unknown to him. Inasmuch as 2,664 quarters alone were shipped, they alone have been carried the whole voyage; for them freight is payable.

Mr. Baron ALDERSON: The case is closely analogous to that of the pregnant females in *Mallay*, p. 156, where no freight is payable for infants delivered on the voyage; also where freight is contracted for the transport of animals, the freight is payable only for those which arrive alive; and again, where goods, such as sugar and molasses, have wasted in bulk during the voyage, the freight is payable for the amount which arrives.

The LORD CHIEF BARON: I agree that the bulk or weight, as taken at the port of destination, may be, *prima facie*, the criterion of the freight to be paid; but when it is proved, and found by the jury, that the test is fallacious and untrue, and that the real quantity shipped was a different and smaller quantity, then I think the freight ought to be calculated on the true quantity shipped; the master's ignorance of the true quantity, as expressed in the bill of lading, cannot entitle him to charge freight according to a false estimate. In case of a cargo of sponge shipped dry, to be paid for by weight, the consignee might certainly squeeze out all the water imbibed, if any, and pay for sponge only. If it can be accurately known and ascertained what ought to be separate, though the separation cannot in fact be made, it is known what ought to be deducted from the claim of freight, and the deduction, which is possible, ought to be made. Here the measure of the wheat shipped was known, is proved, and found by the jury. I think, therefore, that freight for this increased bulk cannot be claimed under the bill of lading. [*Rule made absolute.*]

420. In the case of the *Hvidtsfeldt*, tried, 1856, at Cork, the master signed bill of lading for 664 kilos of wheat of good quality, Moldavian produce, dry sifted and well conditioned, shipped at Galatz. Discharged 1,001 quarters; freight paid on 949½ quarters only. Action for the difference £27 13s. 8d., at 10s. 9d. ½ quarter. Defendants alleged that the cargo was heated and the bulk thereby increased from 3 to 6 ½ cent. Galatz wheat averages 56½ to 58 lbs.; this cargo 51½ lbs. Action dismissed. [*This judgment was appealed against, but it was confirmed.*]

421. **Marionople Wheat.** In the Court of Common Pleas, 18th December, 1862, GATTORINO, a shipowner, sued ADAMS, a corn merchant at Cork, for £1,017 7s. 4d., freight, &c., of 4,980 chetwerts of wheat. Of this quantity only 1,800 chetwerts were put on board in Marionople, the remainder, 3,100 chetwerts, was put into lighters taken beyond the bar at Kertch, and placed on board 18th November. The master signed bills of lading at Marionople, the principal place of lading, 30th October. Defendant called evidence to show a custom in London for the purchaser to be at liberty, in such a case as this, to reject the cargo. The judge said that in ordinary cases the purchaser was entitled to have all the cargo on board before signing bills of lading. In this the general principle did not apply, because by the custom at Marionople the owner gave authority to the master to sign as he had done.—Verdict for plaintiff.

422. **Baltic.** Cargoes of grain from the Baltic for England before the introduction of steam into the trade, scarcely ever reached 1,000 quarters, but since steamers have been used as much as 10,000 quarters have been carried. In Prussian and other country ships the ordinary dunnage is covered with mats which extend up the sides, and for which consignees consider they have to pay at a high rate. If the ship is perfectly sound, and the ceiling, pump-well, &c., tight, so that grain cannot find its way into her frame, some merchants consider that the use of mats is injurious, because in the case of leakage, they imbibe the wet, retain it, become mildewed, and cause heat and subsequent injury to the cargo.

423. **Baltic Freights.** At Königsberg, on the 8th February, 1865, the following was issued by Mr. GUSTAV MOELLER: "Our grain merchants had a consultation yesterday, and resolved in future to charter only by weight, viz.: instead of delivered imperial quarter, to be per delivered 496 lbs. for wheat, tares, beans, or peas, other light grain in proportion to the Königsberg rates, as follows:

For Rye.....	2½ ¢ cent. more freight.
For Barley or Seed	7½ ¢ cent. ditto.
For Oats	22½ ¢ cent. ditto.

And at Dantzic, on the 28th of the same month, a meeting of shippers, owners, and brokers was held, when it was resolved, that in future all charters for grain shall be stipulated at per quarter of 496 lbs. for wheat, other grain in proportion, according to the Dantzic Customs, namely that tares, peas, and beans pay the same rate as wheat, while

Rye pays	2½ ¢ cent. more freight.
Barley and Seed	10 ¢ cent. ditto.
Oats	25 ¢ cent. ditto.

But on the 23rd March following, a meeting of deputies from Königsberg, Memel, Stralsund, Stettin, and Dantzic corporations of merchants, took place at Dantzic, when it was stipulated that Baltic freights to great Britain should be per quarter weighed 500 lbs.; and 504 lbs.; peas, beans, and tares the same. By this scale vessels can be chartered either per 500 lbs. or per 504 lbs., according to the cheapness or dearness of freights.

For Rye.....	2 ¢ cent. more for 500 lbs.
For Ruben and Rapeseed, } Linseed, Barley and Buck- } wheat	5 ¢ cent. ditto.
For Oats	22½ ¢ cent ditto.

Freights to France, Holland, and Belgium per 2,400 kilos. wheat. To German ports in the German Ocean per last of 4,500 lbs. wheat.

Other descriptions in the same proportions as freights to England."

424. **Riga.** The produce of Poland from Kieve northward, around the shores of the river Dwina, are sent to Riga. After the operation of thrashing is performed, and the frosts sets in so that the ice on the rivers will bear, the peasantry are engaged in constructing the raft which is to float these cargoes to their destined port. These vessels are formed with much ingenuity and little expense, being put together without the use of a nail, and merely fastened with wooden pegs, and stuffed with hempen tow to make them impervious to water. They burthen from 200 to 500 tons, and are from 200 to 400 feet long, being formed of large trees split into rough boards. A single fir tree forms the rudder, at which ten or twenty men preside, according to the strength required. The most valuable part of the cargo, which is wheat, hemp seed, &c., is stowed in the centre, a space being left around the sides for the package of those goods which a little wet will not materially injure, such as hemp, hempen cordage, &c. This being completed, the vessels are ready to take advantage of the earliest part of the navigable season. As soon as the ice is broken up, they float down with the strong current which succeeds its clearance, and thirty or forty of the peasants, sometimes with their wives and families, take their passage upon it. The owner or his steward meets the cargo at Riga, where, if not disposed of to the merchants, it is warehoused. The vessel is knocked to pieces and sold for firing, or frequently for yard paling, and often fetches no more than from 100 to 200 rubles.

425. **Dantzic.** The navigation of the river Bug is tedious and uncertain, and can only be attempted in the spring, when the water is high. It is the same, though in a less degree, with some of the rivers that fall into the Vistula before it reaches Warsaw; and towards Cracow the Vistula itself is frequently unnavigable, especially in dry seasons, except in spring, and after the midsummer rains, when the snow melts on the Carpathian mountains. The navigation of the Polish rivers in some seasons is more than usually difficult; and corn from the upper provinces does not reach Dantzic till from two to four months later than usual, and is burthened with a very heavy additional expense. In fact the supplies of grain at that port, depend quite as much on the abundance of water in the rivers, or on their easy navigation in summer, as on the goodness of the harvests. There are two modes of conveying wheat to Dantzic by the Vistula. That which grows near the lower parts of the river, comprehending Polish Prussia, and part of the province of Plock, and of Masovia, in the kingdom of Poland, which is generally of an inferior quality, is conveyed in covered

boats with shifting boards that protect the cargo from rain but not from pilfering : they are long, draw about 15 inches, and carry about 150 quarters. These vessels are not however so well calculated for the upper parts of the river. From Cracow, where the Vistula first becomes navigable, to below the junction of the Bug with that stream, the wheat is mostly conveyed to Dantzic in open flats. These are constructed on the banks in seasons of leisure on spots far from the ordinary reach of the water ; however, when the autumn rains or the melted snow of the Carpathian mountains, in the spring flow into the river they are easily floated. Barges of this description are about 75 feet long and 20 feet broad, with a depth of $2\frac{1}{2}$ feet ; they are made of fir, rudely put together, fastened with wooden trenails, the corners dove-tailed and secured with slight iron clamps,—the only iron employed. A large tree, the length of the vessel runs along the bottom, to which the timbers are secured ; this roughly-cut keelson rises 9 or 10 inches from the floor, and hurdles are laid on it which extend to the sides. They are covered with mats made of rye-straw, and serve the purpose of dunnage, leaving below a space in which the water that leaks through the sides and bottom is received. The bulk is kept from the sides and ends of the barge by a similar plan ; the leakage is dipped out at the end and sides of the bulk of wheat. These vessels draw from ten to twelve inches, and yet they frequently get aground : their cargoes usually consist of from 180 to 200 quarters. The wheat is thrown on the mats, piled as high as the gunwale, and left uncovered, exposed to all the inclemencies of the weather, and to the pilfering of the crew. During the passage the barge is carried along by the force of the stream, oars being merely used at the head and stern to steer clear of the sand banks which are numerous and shifting, and to direct the vessel in passing under the bridges. The crews consist of six or seven men, one of whom precedes in a boat sounding in order to avoid the shifting shoals ; this mode of navigating is necessarily very slow, and lasts several weeks, and even months. If during its progress any rain falls, the wheat grows, and the vessel speedily assumes the appearance of a floating meadow. The shooting of the fibres soon forms a thick mat and prevents succeeding showers from penetrating for more than an inch or two. This covering protects the cargo and when it is thrown aside, the main bulk is found in tolerable condition. The vessels are broken up at Dantzic ; their crews return on foot or by rail. When the cargo arrives at Dantzic or Elbing, all except the grown surface is thrown on the banks of the river, spread on sails, exposed to the sun, and frequently turned against the wind, till any slight moisture

is dried. During the night, and when a shower threatens, the heaps are formed like the steep roof of a house, to let the rain run off, and are covered with a linen cloth. When so lying along the banks the wheat is called "on sezerapka." It is frequently a long time after the wheat has reached Dantzic before it is fit to be placed in the warehouses (speichers) which are very well adapted for storing. They consist generally of seven stories, three of which are in the roof; the floors are about nine feet asunder; each is divided into perpendicular partitions, the whole length, about four feet high, by which different parcels are kept distinct. Thus the floors have two divisions, each capable of storing from 150 to 200 quarters, leaving sufficient space for turning or screening; in each floor the windows are always thrown open in dry weather. Those in the speichers are simply openings of $2\frac{1}{2}$ or 3 feet square, with hinged doors (luken) which can be fastened back with hooks. The corn is usually turned over three times a week; the men throw it with their shovels as high as they can, and thus the grains are separated from each other, and exposed to the drying influence of the air. Ships are loaded by gangs of porters with great dispatch; they will complete a cargo of 500 quarters in about three or four hours; moderate-sized vessels lie alongside the speichers; the cargo is usually measured prior to shipment.

426. **Elsinore.** Mr. LUND says, 8th March, 1865,—the Leith merchants buy and sell as follows: wheat, peas, tares, and beans per 504 lbs., or $4\frac{1}{2}$ cwt.; barley, rye, and linseed 448 lbs. or 4 cwt.; oats, 336 lbs. or 3 cwt. These are above the natural weights of the grain per quarter, as the following approximate estimate shows: *wheat*—Baltic and American—weighs usually 472 to 496 lbs. per quarter, average probably 484, Black Sea and Petersburg 456 to 488, average 468; *barley*—Baltic and Danish—408 to 440, average 420; Black Sea, 302 to 402; *oats*—Danish and Swedish—304 to 336, Prussian 296 to 320, Riga 288 to 304, Petersburg 296 to 328, Archangel 288 to 308; *linseed*—Baltic 400 to 432; *peas and tares*—Baltic 496 to 520; *beans*—Baltic 480 to 520; *rye*—Baltic 456 to 472. The relative weights of the various kinds when stowed approximate as follows: the same space contains of peas $2\frac{1}{2}$ per cent. more than wheat, barley $7\frac{1}{2}$ less, linseed $12\frac{1}{2}$ less, oats $27\frac{1}{2}$ to 30 per cent. less. On this basis a ship loading a full cargo of 100 tons wheat, will take in 120½ tons peas, 92½ barley, 87½ linseed, and 72½ oats. These figures will form a guide in chartering for wheat by the ton, with other grain in proportion; but much depends on the stowing and carrying capacity of the ship. Perhaps the difference might be

fairly estimated for general rates at 5 ¢ cent. additional for barley, 12½ for linseed, and 25 for oats, wheat being the standard. Rye, beans, peas and wheat might be estimated equal. These proportional rates are about 2½ ¢ cent. more in favour of the ship than the London printed rates. The table below shows the comparative rates for grain per ton, and per quarter.

427. At **Hamburg**, grain of all descriptions is sold sometimes by weight and sometimes by measure, freight is usually paid per quarter.

Rate per ton.	304 lbs. qr. or 63 lbs. bush.	406 lbs. qr. or 62 lbs. bush.	480 lbs. qr. or 60 lbs. bush.	446 lbs. qr. or 56 lbs. bush.	424 lbs. qr. or 53 lbs. bush.	400 lbs. qr. or 50 lbs. bush.	336 lbs. qr. or 42 lbs. bush.	320 lbs. pr. or 40 lbs. bush.	300 lbs. qr. or 37½ lbs. bush.
s.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
3	0 8½	0 7½	0 7½	0 7½	0 6½	0 6½	0 5½	0 5½	0 4½
4	0 10½	0 10½	0 10½	0 9½	0 9	0 8½	0 7½	0 6½	0 6½
5	1 1½	1 1½	1 0½	0 11½	0 11½	0 10½	0 9	0 8½	0 8
6	1 4½	1 4	1 3½	1 2½	1 1½	1 0½	0 10½	0 10½	0 9½
7	1 6½	1 6½	1 6	1 4½	1 3½	1 3	1 0½	1 0	0 11½
8	1 9½	1 9½	1 8½	1 7½	1 6½	1 5½	1 2½	1 1½	1 0½
9	2 0½	2 0	1 11½	1 9½	1 8½	1 7½	1 4½	1 3½	1 2½
10	2 3	2 2½	2 1½	1 11½	1 10½	1 9½	1 6	1 5½	1 4
11	2 5½	2 5½	2 4½	2 2½	2 0½	1 11½	1 7½	1 6½	1 5½
12	2 8½	2 7½	2 6½	2 4½	2 3½	2 1½	1 9½	1 8½	1 7½
13	2 11½	2 10½	2 9½	2 7	2 5½	2 3½	1 11½	1 10½	1 8½
14	3 1½	3 1½	3 0	2 9½	2 7½	2 6	2 1½	2 0	1 10½
15	3 4½	3 3½	3 2½	2 11½	2 10	2 8½	2 8	2 1½	2 0½
16	3 7½	3 6½	3 5½	3 2½	3 0½	2 10½	2 4½	2 3½	2 1½
17	3 9½	3 9½	3 7½	3 4½	3 2½	3 0½	2 6½	2 5½	2 3½
18	4 0½	4 0	3 10½	3 7	3 4½	3 2½	2 8½	2 6½	2 5½
19	4 3½	4 2½	4 0½	3 9½	3 7½	3 4½	2 10½	2 8½	2 6½
20	4 6	4 5½	4 3½	3 11½	3 9½	3 6½	3 0	2 10½	2 8½
21	4 8½	4 7½	4 6	4 2½	3 11½	3 9	3 1½	3 0	2 9½
22	4 11½	4 10½	4 8½	4 4½	4 1½	3 11½	3 3½	3 1½	2 11½
23	5 2½	5 1	4 11½	4 6½	4 4½	4 1½	3 5½	3 3½	3 0½
24	5 4½	5 3½	5 1½	4 9½	4 6½	4 3½	3 7½	3 5½	3 2½
25	5 7½	5 6½	5 4½	4 11½	4 8½	4 5½	3 9	3 6½	3 4½
30	6 9	6 7½	6 5½	5 11½	5 8½	5 4½	4 6	4 3½	4 0½
35	7 10½	7 8½	7 6	6 11½	6 7½	6 3	5 3	5 0	4 8½
40	9 0	8 10½	8 6½	7 11½	7 6½	7 1½	6 0	5 8½	5 4½

428. **France.** French wheat and grain usually pay freight at per tonneaux of 1,000 or 1,015 kilogrammes, of which 2½8 are equal to 480 lbs. or 1 quarter. Grain to England in chesse mareés, which usually carry about 300 to 600 quarters each, is dunnaged with fagots of brushwood, and sometimes rough battens, covered with mats, all of which usually become the perquisite of the consignee. In chartering from French ports in the Bay of Biscay, serious difficulties have occurred when the charter-party has stated "maize, at freight of 2s. 6d. to 3s. ¢ quintal selon l'usage." The French word

"quintal" is "hundred weight" in every dictionary. The charter-party intended to have said "quarter" selon usage. Complaints have been made by masters that whereas in France barley is weighed on board on an even scale, it is weighed out in England on the turn of the scale; this is of course against the ship.

429. Paris, 26th of February, 1865. To the French Chamber of Commerce. Gentlemen,—His Excellency the Minister of Foreign Affairs calls my attention to the disputes which frequently arise between the captains of French ships and merchants at Glasgow relative to the cargoes of grain sent from France to the Clyde. According to information transmitted by the Consul of France at that port, almost all these difficulties arise from both the quantity and the weight of the grain conveyed being set forth in the consignments. The number of hectolitres is ascertained with sufficient exactness when taken on board, but the same is not the case with the weight, which, calculated on an average, and admitting it to be correct on leaving, often presents marked variations on arriving, by the simple fact of a long passage. With the view of preventing the return of difficulties of this kind, I have thought, gentlemen, that it would be right to modify established usage by only inserting for the future in the consignments one of the two measures heretofore given. It will, consequently, be of interest to choose that measure of capacity which is generally favourable to our captains at the moment of discharging the cargo. Accept, &c. ARMAND BEHIC.

430. **Deficiency of French Cargo.** A ship-broker asks the *Gazette*, 14th October, 1858,—A vessel was chartered at Nantes for a port in Ireland, the cargo to be shipped as customary, and the master to take an account of it, and sign bills of lading accordingly; the freight to be paid at 11s. 7^d ton of 15 hectolitres ("onze shillings sterling par tonneau de quinze hectolitres délivrés, et une livre gratification au capitaine.") The cargo was shipped, the quantity being per bill of lading, 2,087 hectolitres wheat weighing 165,776 kilogrammes; the vessel delivered 750 quarters, or 2,181⁷/₈ hectolitres of 2³/₄ bushels per hectolitre, on which freight for 145¹/₄ tons is demanded, but the merchants decline paying for more than is expressed in the bill of lading, alleging that the ship has delivered some 10 or 12 cwt. short of the weight shipped, which the master does not dispute, as he protested at Nantes against the weight as shipped, and noted same on bills of lading. The answer is: the master having noted protest at port of shipment against the correctness of the quantity named in the bill of lading, should have withheld the delivery at the port of destination, until security was given for payment of freight on the quantity delivered in good order and condition.

431. **Surplus Cargo.** In the Liverpool County Court, 21st January, 1858, *CROOKE v. HUBBACK*, ship *Livingstone*, brought wheat at 4s. "par chaque quartier imperial délivré." Bills of lading were signed at Marseilles for "3,352 charges of 160 litres, equal to 1,843 imperial quarters." At Liverpool the cargo turned out 2,033 quarters. Plaintiff contended that in the first place the master was

bound by the bills of lading, and that the quantity stated thereon was, at all events, between him and an indorsee, all on which he was entitled to freight. In delivering judgment, Mr. BLAIR said : " I know no authority for giving such effect to a bill of lading even without the memorandum here appended—' not accountable for quality, quantity, or measure.' If the master has carried a larger quantity than signed for, he is as much entitled to freight for the surplus as if he had carried a larger amount of barrels or bags than stated in the bill of lading. But it was further urged on the authority of *GIBSON v. STURGE*, that the increase in the number of quarters had occurred by heating during the voyage, and that, therefore, freight could only be demanded on the smaller quantity, as being all ' received, carried, and delivered,' and that all these things must concur to entitle him to freight. In *GIBSON v. STURGE* [page 243], the jury found as fact, that no more than the smaller quantity had been received. Here there is no direct proof of the quantity shipped, unless the bill of lading is to be looked on as such. I have already stated why I do not consider the master as estopped by these figures, but further, the evidence satisfies me that the statement in the bill of lading is incorrect. I cannot conceive that the cargo could have increased by heating from 1,843 to 2,033, *i.e.* 190 quarters, when the witnesses for the defence do not speak of ever having known such a cargo to have increased by more than 100; and according to their evidence, the cargo, which it is admitted, sustained no damage from any defect in the ship, had, in all probability, been already heated on the way from Ibrail to Marseilles, and had been put on board without having been sufficiently dried. I have also the master's evidence, that the cargo entirely filled the vessel on leaving Marseilles, and that it had sunk from nine inches to a foot before arrival. It is quite clear that the bulk had not increased after leaving Marseilles, by any neglect or malversation on his part, or any defect in the ship; and I am satisfied, if it increased to any extent on the voyage, it did not increase to anything like the extent of 190 quarters, and that, in point of fact, a larger quantity was shipped than that mentioned in the bill of lading. Whether this is to be attributed, as alleged, to there being a miscalculation in the number of "charges" to the imperial quarter, I do not stop to enquire; nor, in the view I take of the case, is it necessary to ascertain the precise quantity shipped, inasmuch as I think the freight is to be calculated upon the quantity ascertained on her discharge in the Albert Dock. I think the terms of the charter-party can bear no other reasonable meaning. In '*GIBSON v. STURGE*,' (sec. 419, &c.) the charter-party did not contain the expression 'for each quarter delivered,' nor any equivalent terms, and the reasoning on which that judgment was founded does not apply; and it is to be observed that even in that judgment on those premises, all the court did not concur. It was urged that for 'each quarter delivered' meant for each quarter the master might carry and deliver of those which, by the bill of lading, he admitted he had shipped; but this construction seems rather forced, and I think the true construction of the bill of lading, with the annexed memorandum, and of the charter together is, that both parties treated the quantity turned out at the port of discharge, as the measure of the freight. Any other construction, I may remark, would impose a great hardship on the master, who taking in his cargo in bulk, would have no mode of testing the accuracy of the bills of lading, except by a very rough estimate of his vessel's capacity." Verdict for plaintiff. This decision gave much dissatisfaction to the trade, who observe that the judge decided on the ground of a supposed error in the quantity shipped,

and not on the ground of the shipowner being entitled to freight or any increase on the quantity during the voyage.

432. **Barley—Nantes.** A French vessel arrived in England in September, 1865, with a cargo of barley from Nantes. The bill of lading says "shipped 1,862 hectolitres, weighing (at the average of 66,166 hectolitres) 123,201 hectolitres. Freight to be paid 96 per 15 hectolitres." The cargo is measured out, but to enable the Customs to get the average weight for payment of duty, a few bags are weighed. According to measure, the cargo turns out nearly eight hectolitres in excess of bill of lading quantity, (freight being specified by hectolitres) but merchants insist on paying freight on average weight. The *Shipping Gazette* is asked who is right? The master has offered to accept freight on bill of lading quantity, which is refused. The Editor answers "the ship is entitled to be paid freight on the measured out quantity, and the master's offer is a fair one."

433. If **Bengal Wheat**, which is of a very dry crisp character, is placed on rice or other general cargo, it is greatly injured by weevil, but when stowed below, and so covered with goods that the air is entirely excluded, it continues sound. If jute or cotton is stowed over wheat, a tier of cases should intervene, or it will become heated.

434. At the **Adelaide** Agricultural Shows in the five years ending 1863, the average weight of grain exhibited was, from the hills 68 lbs. 0½ oz., and from the plains 66 lbs. 1 oz.

435. **Madeira.** In case of breakage in the measurement of corn, after allowing 2½ % cent., the vessel must make up the deficiency at the market price, according to the long-established regulation at the British factory.

436. **Canada.** At Montreal it is usual in charter-parties to Great Britain, for the merchant to find mats and the ship the "requisite dunnage." On arrival the merchant will possibly offer to fit the internal casing; the master should observe his own discretion and have it done in the most economical manner, remembering that he ought to know best the ship's character and sea-going qualities. All unnecessary wood-work and casing involves a direct loss in its cost, and possibly indirect loss by displacing cargo and thereby preventing the gain of freight. All ships loading grain in bulk at Montreal must leave sufficient space inside the pump-casing for a man to descend to the well. LLOYD's instructions for stowing grain at Montreal will be found in page 256.

PORT CHARGES AT NEW YORK.

	\$	c.
Custom-house charges <i>in</i> , once each year, $\frac{1}{2}$ ton {		
register, American measure	0	30
Ditto, <i>outwards</i> from \$3 75c. to	10	0
Entry fee on each vessel	5	50
Harbour master, $\frac{1}{2}$ ton.....	0	1 $\frac{1}{2}$
Health officer, each vessel	6	50
State hospital money, each man.....	0	50
Ditto, each mate	1	0
Ditto, for captains	1	50
Towage, transporting ship not exceeding 200 tons, \$10; 400 tons, \$15; 500 tons, \$17; 800 tons, \$20; and upwards.		
Port Warden, each survey, \$2; Advertising \$1; Certificate, \$1 25c.		

Wharfage, 1c. $\frac{1}{2}$ ton for first 200 tons, and $\frac{1}{4}$ c. $\frac{1}{2}$ ton for each additional ton, and in outside berth half wharfage.

Pilotage *in*.—From April 1st to November 1st. From 6 to 13 feet 6 inches, \$3 75c. $\frac{1}{2}$ foot, 94c. $\frac{1}{2}$ foot additional for off-shore; 14 to 17 feet 6 inches, \$4 50c. $\frac{1}{2}$ foot, and \$1 12 $\frac{1}{2}$ c. $\frac{1}{2}$ foot off-shore; 18 to 20 feet 6 inches, \$5 50c. $\frac{1}{2}$ foot, and \$1 37 $\frac{1}{2}$ c. $\frac{1}{2}$ foot off-shore; 21 to 25 feet, \$6 50c. $\frac{1}{2}$ foot, and \$1 62 $\frac{1}{2}$ c. $\frac{1}{2}$ foot off-shore.

Pilotage *out*.—From April 1st to November 1st, from 6 to 13 feet 6 inches, \$2 70c. $\frac{1}{2}$ foot; 14 to 17 feet 6 inches, \$3 10c. $\frac{1}{2}$ foot; 18 to 20 feet 6 inches, \$4 10c. $\frac{1}{2}$ foot; 21 to 25 feet, \$4 75c. $\frac{1}{2}$ foot; no off-shore; must take the first pilot that hails the ship.

From November 1st to April 1st same rates as above, with an *additional* charge of \$4 $\frac{1}{2}$ vessel (being winter months.)

Stevedore discharging.—Coffee, 2 $\frac{1}{2}$ c. $\frac{1}{2}$ bag; tea, 25c. $\frac{1}{2}$ ton; sugar, 25c. to 30c. $\frac{1}{2}$ hogshead, 10c. to 12c. $\frac{1}{2}$ box, 5c. $\frac{1}{2}$ bag; light goods, 30c. $\frac{1}{2}$ ton; heavy goods, 40c. $\frac{1}{2}$ ton.

Loading.—Flour, 6c. $\frac{1}{2}$ barrel; petroleum oil, 10c. $\frac{1}{2}$ barrel, and cases 2c. each; grain, by elevator, \$7 50c. $\frac{1}{2}$ 1,000 bushels; cotton, compressed, 56c. $\frac{1}{2}$ bale, and by hand, 37 $\frac{1}{2}$ c.

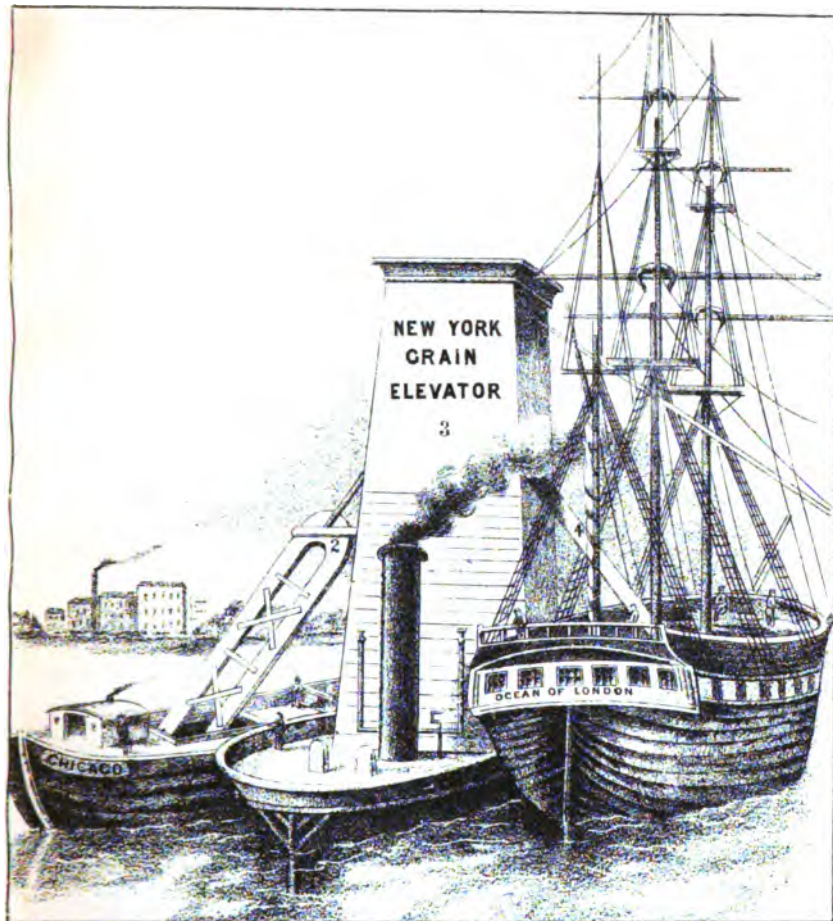
437. In June, 1862, the brig *Alliance*, loaded in bulk at New York, 1,450 quarters of wheat (59 lbs. $\frac{1}{2}$ bushel) say 295 tons. Her sheathing displaced say 30 tons, equal to 150 quarters. So laden she drew 13 $\frac{1}{2}$ feet forward and 13 $\frac{1}{2}$ feet aft. With 327 tons Cardiff coal her draught was forward 14 feet, aft 13 feet 10 inches. She registers 205 tons, is 89 feet long, 25 broad, and has a depth of hold of 14 feet. Capt. MOSSMAN took a portion of his cargo, 100 quarters in a bulked compartment aft, and 40 quarters forward, to throw into the hold in case the main cargo settled. She was 26 days on the passage to Plymouth, but there was no occasion to open the hatches. The first 700 quarters were sent into the hold in two hours, by

elevators which were then stopped by the master, the remainder was trimmed by the shovel, the only means considered by him suitable for filling in the ends and other vacancies, the beam fillings, &c. The elevators were formed of a series of fans, wheel-fashion, fitted into a wooden trunk; they were worked by a steam engine and threw the grain up with amazing rapidity. Two elevators were used; the first sent the grain up to the weighing machine; after it was weighed the next sent it into the ship's hold; in passing through the second elevator all the chaff and refuse were thrown off. This process diminishes the weight a little but makes the grain much better qualified for a long passage at sea, as the refuse usually encourages heat which is so detrimental to grain. Masters of small vessels, when loading by elevators, are recommended to stop the machines occasionally, and send an officer into the hold to see that the grain is well trimmed into every part. If not stopped in time it is impossible to perform this very important duty, in consequence of the danger of suffocation; the men cannot remain below more than an hour at a time. If not properly trimmed, the grain has no opportunity to settle or to become packed, and thus when the ship is in motion at sea, the cargo shifts to leeward, almost invariably works through the ceiling into the pump-wells and so chokes the boxes.* With large ships laden in compartments or bins, this precaution may not be necessary. The hold of the *Alliance* was fitted fore and aft with a bulk which descended from the deck say 5 feet 4 inches to the beams. She had on her ceiling a grain-tight platform fitted on riders which were previously "tommed up" to the height required. The platform was 10 inches high near the keelson and 14 inches at the bilges; boards three inches from the skin, ran all the way up to the deck. So sheathed an ordinary ship cannot be laden deeply with grain. The board used was a first-class pine which cost about a cent and a half per bushel, say \$179 or £37. Hemlock board is very liable to split in pieces—a serious inconvenience to the cargo, besides which the chips are likely to get into the pump-well and choke the pumps.

428. The barque *Marinus*, 512·16 tons register, Capt. WILLIAM T. IRVING, belonging to Messrs R. HANSELLS & SONS, of North Shields, left New York, 23rd August, 1864, with 3,325½ quarters of grain, and discharged the same at Dublin in September. She was dunnaged with cross bars, with chocks under, bottom 10 inches bilges 14; from keelson to turn of bilge she was double covered with

* It is supposed that for want of the performance of this duty, twenty-eight grain-loaded British ships were lost in the winter of 1861.

STEVENS ON STOWAGE.



EXPLANATION.

FIGURE 1 represents an Erie Canal Boat (the CHICAGO) loaded with Grain.

FIGURE 2 is the outer leg of an Elevator (a capacious pipe or trunk), through which passes a belt having attached to it a series of buckets, which raise the grain from the boat's hold to a spout that conveys it into a Receiving Hopper in the middle of the tower 3.

The grain then falls into a Weighing Hopper provided with a trap, which allows it to drop to the foot of a second elevator, which raises it to the top of the tower.

The grain then passes down through a revolving separator to a cleaning apparatus at the foot of a

THIRD elevator, which raises it a second time to the top, when it falls into the head of the pipe 4, and is thus delivered into the hold of the OCEAN.

The Belt which passes through the outer leg of the elevator, is 30 inches wide; the buckets are attached 18 inches apart from each other; they hold a quarter of a bushel each. After tilting their contents into the spout the empty buckets are returned by the belt down the inner leg of the elevator, into the hold of the canal boat to be re-filled.

In the Weighing Hopper the grain is weighed in drafts of about 50 bushels each.

The machine, which is worked throughout by steam power, can handle 4,000 bushels an hour.

inch boards; the entire lining cost the ship $2\frac{1}{2}$ cents p bushel, \$580 99c. The *Marinus* is 133 feet 6 inches long, 29 broad, and 18 feet 9 inches deep. With the grain she drew at New York 17 feet 9 inches aft, and 17 feet 7 inches forward; at Dublin 2 inches less fore and aft. With 700 tons of Shields coal 17 feet 10 inches forward, and 18 feet aft. Her best trim at sea is 3 to 6 inches by the stern. The Customs' charges inwards at New York with a Newcastle cargo of soda, &c. (which see), were \$76 70c., manifest stamp \$3, Customs' outward \$6 20c., wharfage at New York piers \$45 19c. wharfage at the Atlantic dock, Brooklyn, New York \$130 34c. Pilotage in \$66 99c., out \$49 50c. The grain received was, in bulk 19,322 bushels, in ship's bags 6,500=3,225 bushels; cargo delivered 3,195 $\frac{1}{4}$ bushels or 684 tons 15 cwt. 1 qr. 12 lbs. at 5s. 3d. p quarter of 480 lbs.=£838 16s. 4d. Her charter-party stated that she was to load "a full and complete cargo of wheat in bulk" and proceed to Cork for orders, and thence to a safe port; and that she was to be paid "5s. 9d. p quarter of 480 lbs. delivered; 6d. less p quarter if ordered to a direct port on signing bills of lading; 10 p cent. additional freight if ordered to the continent. Thirty running days for loading and discharging; 24 hours for orders at Cork. Vessels to load under New York underwriters' inspectors," whose rules are in page 259. The master understood that the chief object for referring to these rules was to secure sufficient dunnage and lining, but when he had received about 200 quarters, the merchant informed him unexpectedly that he would not be allowed to load more than half the registered tonnage in bulk, the remainder must go in bags. Thus half the tonnage (512) would be 256 tons, which at 60 lbs. p bushel would give 1,194 quarters 5 $\frac{1}{4}$ bushels. As this would have involved a serious loss to the ship, the master paid to the company in which the merchant was insured, the difference of the premium, viz.: \$300, exchange being at \$217 per £ sterling, and the following addition was made to the charter-party: "I hereby waive the clause to be loaded under New York underwriters' inspection. The vessel to take instead one quarter of cargo in bags." This proportion, one quarter in bags, is in accordance with the rules of the clubs in Newcastle and Shields, one-fourth from 20th April to 20th September; and one-third from 20th September to 20th April, in bags or barrels.

INSTRUCTIONS FOR STOWING GRAIN CARGOES AT MONTREAL.

Issued 1st May, 1862, by Mr. H. CHAPMAN, Agent for LLOYDS.

1. Owners, commanders, and masters of vessels are considered in law as common carriers; it is, therefore, necessary that all due precaution be taken to receive and stow cargoes in good order; and deliver the same in like good order. The law holds the shipowner liable for the safe custody of the goods when properly and legally received on board in good order, and for the "delivery" to parties producing the bill of lading. Goods are not unfrequently sent alongside in a damaged state, and letters of indemnity given to the captain by the shippers for signing in good order and condition. This is conniving at fraud.

2. No ship exceeding 400 tons register can be entirely loaded with grain in bulk; all exceeding 400 tons register may take two-thirds of the cargo of grain in bulk, and one-third in bags, or rolling freight instead thereof. In the latter case, the grain in bulk should be stowed six inches but not more, above the beams to allow for settling.

3. When ships take wheat, corn, &c., in bulk, it must be stowed in sections or "*bins*," (not to contain more than 12,000 bushels each), to be lined with thoroughly seasoned boards grain-tight, not less than 10 inches from the flat of the floor, and from 14 to 16 inches in the bilges, graduated to the sides, which must be clapboard lined to the deck. Care must be taken to preserve a water-course under the lining. Good shifting boards, secured to the stanchions, extending at least six feet downwards, and fitted tight to the deck. The stanchions not to be removed, but firmly secured. No loose grain to be stowed in the extreme ends, and no admixture of other goods. Pumps and masts cased or covered with mats or canvas, made thoroughly grain-tight, with sufficient space in the well to admit the passage of a man to the heels of the pumps, and access had to the same by a man-hole from the deck, or by a clear passage from the 'tween decks aft. Mats to be used for covering knees, keelsons, and stanchions if required, but not for lining or covering the sides.

4. Grain, when stowed in *bags*, must be dunnaged not less than 10 inches on the floor, 14 to 16 inches on the bilges, 3 inches on the sides up to the deck; between decks the dunnage must be laid 'thwart ships, at least 2 inches from the deck. Shifting plank extending at least 4 feet from the deck beams downwards, secured to stanchions. The dunnage in the hold must be entirely covered with boards and sails, or mats grain-tight.

5. All bulk or loose grain must be taken in bins prepared for that purpose.

6. For *dunnaging*, deals are preferable to anything else. They should be laid fore and aft, about 3 inches apart, the second tier over the spaces of the first tier, the third over the spaces of the second, and so on. Staves or other materials generally used for dunnage, to be placed so as to give free course for the water to reach the pumps. The dunnage should be raised from 10 to 12 inches from the floor, and in the bilges from 14 to 16 inches according to the build of the ship and the discretion of the inspector. Flat-floored, wall-sided ships should be fitted with bilge pumps.

7. The *studs* for the *bulkhead* should be made of 3-inch deals, placed about two feet apart, and firmly secured at the top and bottom, and properly braced and cleated on the lining and to the beams (or deck), to resist the pressure of the grain.

8. The *studs* for the *bulkheads forward* and after bulkheads for ships not exceeding 10 feet depth of hold, must be 4×6 inches in size, and of one entire piece; over a depth of 16 feet they must be 4×8 inches. They must be set 20 inches apart from centre to centre, firmly secured at top and bottom, and properly braced and cleeted on ceiling and deck, to resist the pressure of the grain.

9. The sides above the turn of the bilge must be lined on one-inch battens after the manner of clapboarding.

10. *Shifting planks*, two inches thick, must extend to the deck on each side of the stanchions, fitted tight under and between the beams and carlines, and extend not less than six feet downwards; care must be taken that the stanchions are well secured at both ends. In no case can single boards be substituted for plank, and the shifting boards must be shored from the sides, midway between the stanchions.

11. Materials for bins must be perfectly seasoned; unseasoned lumber must not be used where it will come in contact with the grain. Water tanks, whether of wood or iron, must be cased with wood to prevent damage from sweat or leakage. And all ships with grain in bulk, ought to have feeders and ventilators.

12. It must be seen that the grain is well *trimmed* up between the beams, and the space between them completely filled.

13. When chartering the *draught of water* should be limited, and provision made for loading under inspection.

14. The *load draught* must be regulated by the depth of the hold, allowing three inches to every foot depth of hold, measured from lowest line of sheer of deck amidships to the water when upright. Ships having an additional deck put on after construction, the depth of hold to be measured from original deck.

15. Frequently serious loss falls on merchants on the upper part of cargoes, particularly in ships that bring wheat, corn, tobacco, oil cake, &c., arising from *vapour damage* imbibed by wheat, flour, and other goods, stowed with turpentine, or other strong-scented articles; the shippers are to blame for such negligence, for not making due inquiry before shipping.

16. Pot and pearl ashes, tobacco, bark, indigo, madders, gum, &c., whether in casks, cases, or bales, to be dunnaged in the bottom, and to the upper part of the bilges, at least 9 inches, and 2½ inches at the sides.

17. Miscellaneous goods, such as boxes of cheese, kegs and tubs of lard or other small or slight-made packages, not intended for broken stowage, should be stowed by themselves, and dunnaged as other goods.

INSTRUCTIONS FOR STOWING CARGOES AT NEW YORK.

Issued 2nd January, 1862, by Mr. R. MACKIE, Agent for LLOYDS.

1. Owners, commanders, and masters of vessels are considered in law as common carriers; it is, therefore, necessary that all due precaution be taken to receive and stow cargoes in good order; and deliver the same in like good order. The law holds the shipowner liable for the safe custody of the goods when properly and legally received on board in good order, and for the "delivery" to parties producing the bill of lading. Goods are not unfrequently sent alongside in a damaged state, and letters of indemnity given to the captain by the shippers for signing in good order and condition. This is conniving at fraud.

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2. No vessel exceeding 400 tons register can be entirely loaded with grain in bulk ; exceeding 400 tons, and not over 500 tons, may take two-thirds of the cargo in bulk, and one-third in bags ; and all over 500 tons can only be allowed to take half of their tonnage in bulk.

3. When ships take wheat, corn, &c., in bulk, it must be stowed in sections or "*bins*" (not to contain more than 12,000 bushels each), to be lined with thoroughly seasoned boards grain-tight, not less than 10 inches from the flat of the floor, and from 14 to 16 inches in the bilges, graduated to the sides, which must be clapboard lined to the deck. Care must be taken to preserve a water-course under the lining. Good shifting boards, secured to the stanchions, extending at least six feet downwards, and fitted tight to the deck. The stanchions not to be removed, but firmly secured. No loose grain to be stowed in the extreme ends, and no admixture of other goods. Pumps and masts cased or covered with mats or canvas, made thoroughly grain-tight, with sufficient space in the well to admit the passage of a man to the heels of the pumps, and access had to the same by a man-hole from the deck, or by a clear passage from the 'tween decks aft. Mats to be used for covering knees, keelsons, and stanchions if required, but not for lining or covering the sides.

4. Grain, when stowed in *bags*, must be dunnaged not less than 10 inches on the floor, 14 to 16 inches on the bilges, 3 inches on the sides up to the deck ; between decks the dunnage must be laid 'thwart ships, at least 2 inches from the deck. Shifting plank extending at least 4 feet from the deck beams downwards, secured to stanchions. The dunnage in the hold must be entirely covered with boards and sails, or mats grain-tight.

5. All bulk or loose grain must be taken in bins prepared for that purpose.

6. The *ceiling* of the floor and for the bins, must be laid on rickers, or sleepers, of scantling 3 x 4 inches in size, 14 inches apart from centre to centre, thoroughly nailed and secured. It must be raised at least 10 to 12 inches from the floor, and in the bilge 14 to 16 inches, according to build, increased at discretion of the surveyor. In no case must the floor of the bin be laid on loose dunnage, nor must it be laid on the bilge keelsons, notwithstanding the keelsons may be more than 12 inches high, but there must always be sufficient room for a water-course under it. The floor is considered as extending from the keelson to the side, and not terminating at the bilge keelsons. It must be laid with two thicknesses of boards, so that they will break joints at the edges and ends ; and care must be taken that it be perfectly tight.

7. The *studs* for the forward and after *bulkheads* for vessels not exceeding 16 feet depth of hold, must be 4 x 6 inches in size and of one entire piece ; of a greater depth than 16 feet, they must be 4 x 8 inches. They must be set 20 inches apart from centre to centre, firmly secured at the top and bottom, and properly braced and cleeted on the ceiling and deck to resist the pressure of the grain.

8. The sides above the turn of the bilge must be ceiled after the manner of clapboarding reversed, so as to turn the water from the grain.

9. *Shifting planks*, two inches thick, must extend to the deck on each side of the stanchions, fitted tight under and between the beams and carlines, and extend not less than six feet downwards ; care must be taken that the stanchions are well secured at both ends. In no case can single boards be substituted for plank, and the shifting boards must be shored from the sides, midway between the stanchions.

10. Materials for bins must be perfectly seasoned ; unseasoned lumber must not be used where it will come in contact with the grain. Water tanks, whether

of wood or iron must be cased with wood to prevent damage from sweat or leakage. And all ships with grain in bulk ought to have feeders and ventilators.

11. It must be seen that the grain is well *trimmed* up between the beams, and the space between them completely filled.

12. When chartering the *draught of water* should be limited, and provision made for loading under inspection.

13. The *load draught* must be regulated by the depth of the hold, allowing three inches to every foot depth of the hold, measured from lowest line of sheer of deck amidships to the water when upright. Ships having an additional deck put on after construction, the depth of hold to be measured from original deck.

Ships loading grain complying strictly with the above rules, lined and loaded under the supervision of LLOYD'S surveyor, will be entitled to a certificate to that effect. Application to be made in writing, accompanied with a fee of ten dollars for supervision of certificate.

[At Montreal it is calculated that the charges for elevators for 30,000 bushels of grain is at the rate of a quarter of a cent. per bushel, or 75 dollars.]

INSTRUCTIONS FOR STOWING BY THE NEW YORK UNDERWRITERS.

1. The *pump-well* must be sufficiently large to admit of the passage of a man to the bottom of the hold, and room to work conveniently when there, say not less than four feet fore and aft, and five feet athwartship (reference, however, must be had to the size of the keelson and assistant keelsons), and must be cased from the bottom of the vessel to the lower deck beams.

2. Access to the pump-well must be had either by a man-hole through the upper deck, or by a clear passage-way between decks from the after hatch. In no case must it be from the main hatch.

3. Vessels being loaded with *grain in bags* must be dunnaged 12 inches on the floor, 15 inches on the bilge, and 4 inches on the sides up to the beams. If the vessel be very flat, the dunnage in the bilge must be increased at the discretion of the surveyor. The cargo between decks must be dunnaged 3 inches from the sides, and 2 inches from the deck, and the dunnage laid athwartships, so that the water can run to the scuppers.

4. The *dunnage* in the hold must be entirely covered with sails or boards, so as to prevent any of the loose grain from running down on to the floor of the vessel, and thence to the pump-well. If sails are used, they must be of good quality, and free from holes. When boards are used, care must be taken that they have a firm and equal bearing on the dunnage, and that the edges and ends overlap, so that the object above designated may be secured.

5. Two-inch *shifting planks* extending four feet from the beams downward, must be properly secured on each side of the stanchions in the hold, and between decks, to prevent the cargo from shifting, and care must be taken that the stanchions are well fastened at the top and bottom. In no case must single boards be substituted for planks.

6. Care must be taken that the bags which are stowed in the ground tier, as well as those that are next to the sides of the vessel, are in perfect order, and that the tiers are laid close and well filled.

7. Bulk or *loose grain* must be taken in bins prepared for that purpose, and no vessel will be permitted to load with more than one-half of her U.S. registered tonnage, with *grain in bulk*.

8. Rules 1st and 2nd likewise apply to vessels being loaded with grain in bulk.

9. The *floor of the bin* must be laid on sleepers of scantling 3×4 inches in size, 14 inches apart from centre to centre, supported by studs of a corresponding size, also 14 inches from centre to centre. It must be raised at least 12 inches from the floor of the vessel, in the bilge 15 inches, and in vessels that are very flat, increased at the discretion of the surveyor. In no case must the floor of the bin be laid on loose dunnage, nor must it be laid on the bilge keelson, notwithstanding the keelson may be more than 12 inches high, but there must always be sufficient room for a water course under it. The floor is considered as extending from the keelson to the side of the vessel, not terminating at the bilge keelson. It must be laid with two thicknesses of boards, so that they will break joints at the edges and ends; care must be taken that it be perfectly tight.

10. The *studs* for the forward and after *bulkheads* for vessels not exceeding 14 feet depth of hold, must be 4×6 inches in size and of one entire piece; for vessels of a greater depth than 14 feet, they must be 4×8 inches. They must be set 20 inches apart from centre to centre, firmly secured at the top and bottom, and properly braced and cleeted on the ceiling of the vessel, to resist the pressure of the grain.

11. The sides of the vessel above the turn of the bilge must be ceiled after the manner of clapboarding reversed, so as to turn water from the grain.

12. *Shifting-planks* two inches thick must extend from the keelson to the deck on each side of the stanchions, fitted tight under and between the beams and carlines, and care must be taken that the stanchions are well secured at both ends.

13. *Water-tanks*, either of wood or iron, must be properly cased to prevent damage from leaking.

14. Vessels loaded with over 12,000 *bushels* of grain in *bulk*, must have one intermediate partition or bulkhead, and if carrying *more than 20,000 bushels*, then additional partitions or bulkheads, so that no bin shall contain over 12,000 bushels.

15. Materials for bins must be of perfectly seasoned stock; unseasoned lumber must not be used where it will come in contact with the grain.

16. Stevedores must see that the grain is well trimmed up between the beams, and the space between the beams completely filled. *The draught of water to be regulated by the surveyor.*

17. Owners and masters are particularly requested to inform the surveyor at this office, of any vessel they may intend to load with grain.

☞ Vessels loaded strictly in conformity to the above rules will have a certificate to that effect from the surveyors appointed by the Board of Underwriters, furnished to the Board, and the respective Insurance Companies composing the said Board will be duly notified thereof.—October, 1869.

ELLWOOD WALTER, *Secretary.*

439. It is suggested that from September to March ships from America should not load more than 17 tons dead-weight ~~of~~ keel, or about 78 quarters wheat to every 13 tons register, *n.m.*, instead of

overloading them with 97 quarters or nearly 20 tons. British merchants calculate a loss of 1 $\frac{1}{2}$ cent. by measuring with the bushel grain loaded by elevators.

440. **Valparaiso.** Occasionally copper bars are shipped here as ballast with cargoes of grain. In the fall of 1886, the *Ann Wood* had about 100 tons of bars covered with planks to receive 3,440 quarters in bulk, and 2,999 sacks barley. On discharging 48 quarters and 7 bushels were found damaged. During heavy weather the planks had separated, the barley fell between and was injured by verdigris, &c. At the trial at Bristol in August, 1867, the jury gave a verdict for £32 4s. 0d. damages.

441. Extracts from the report of S. F. MACKIE, Esq., LLOYD'S Agent at **New York**, on the seaworthiness of vessels with grain cargoes. "Bulk grain is a semi-fluid whose angle of repose is 30°. This angle is determined for perfect still masses of grain on shore; while the same grain when afloat, from the rolling and pitching motion of the vessel, would only have a repose angle of 15°, and as soon as the list of the vessel exceeds the angle of repose the grain will commence to move; and as it is certain that a vessel will roll through a greater angle than 15°, it is almost certain that bulk grain will move more or less every voyage. That the effect of shifting boards is very great, and that no vessel is seaworthy without them, and if their number is increased the seaworthiness is rapidly increased and by using several sets the shifting of the cargo is practically reduced to an insignificant quantity. With one set of shifting boards it is quite possible that many vessels are hardly seaworthy, but there can be no doubt that any vessel is seaworthy when she has two or three sets. If it were possible to keep the hold full of grain there could be no shifting, but as grain settles this is impossible. Men of great experience say that with careful trimming this settlement will be from 5 to 7½ per cent. of the depth of the hold, and with slack trimming of course it will be much more. That it is unquestionable that grain moves under shifting boards which do not extend from deck to ceiling. That the value of good shifting boards can hardly be over estimated. If they are not strong enough and give way, the vessel is utterly at the mercy of the waves, and only requires to meet with sufficiently bad weather to go to the bottom. Once she gets a bad list no seamanship can save her—once on her beam ends she must infallibly go, and it would be idle to cut away the masts in the vain hope of saving her; yet until the wave come which gave that one too deep roll, and before which there will be no sign to betray her instability, she would act as if she were a stiff seaworthy ship."

442. In most **United States** ports rules for loading grain have been in force for some years. A vital objection to them is however apparent when we come to apply them in practice: their crying defect is the insufficient strength of the shifting board so that as far as these rules relate to shifting boards they are worthless.

443. The Surveyors to LLOYD'S Register say: "That steamers having comparatively small beam are not so stiff as sailing vessels, and are more liable to become dangerous should the grain shift to one side, or work from side to side as the vessel rolls, even although the rolling is slower, and the grain cannot shift so far, and has therefore less inclining movement. This danger is enhanced if double bottoms, when the latter are of great height, because the whole bulk of the cargo is raised thereby and the vessel made more tender."

444. Grain cargoes could be carried in bulk with perfect safety, if the stowage and shifting boards could be depended upon, but failing that the safest plan is to have a certain portion of the cargo in bags, as is now required at some ports.

445. Of some 66 steamers and sailing vessels with grain reported lost or missing in 1872-73, 22 were from the United States and 17 were from Canada.

446. **Weight or Quantity.** Liverpool County Court, June, 1867. Before Mr. Sergeant WHEELER. *SMITH v. DIXON*. An action to recover £50, value (deceased) of 50 sacks of wheat, shipped at Valparaiso, on board the *M. A. Dixon*, and discharged at Liverpool, April 17th. The weights were taken by plaintiff's and defendant's weighers who agreed in their quantities, 5,320 sacks. Before sailing 566 sacks were skipped for trimming. On discharge 4,775 full sacks were landed as shipped; 50 of the skipped were re-filled, and the remaining sacks were supplied by plaintiff. Defendant averred that before sailing empty sacks were (as usual) stolen from the vessel, but no wheat. The total number of sacks landed was 5,363, or 43 in excess of the bill of lading, but the weight was not equal to the quantity. For deficiency of this freight, £1 17s. 6d. had been deducted; the total paid was £1,514 16s. 8d. The extent of the deficient wheat was disputed. Reducing Spanish to English weight the bill of lading quantity was conceded to be 1,294,607 lbs., but the question arose whether it included the weight of the sacks. Plaintiff made the deficiency 16,740 lbs.; defendant (after deducting the sacks) 2,016 lbs., and that arose from shrinking. The insertion in the bill of lading of the words gross or net, would have obviated much difficulty. Defendant contended he was not bound by weight, but only by quantity. The bill of lading contained the words "weight and quality unknown." Verdict for defendant.

Proportionate Tonnage. The following quantities of grain are required to fill a keel or 850 cubic feet, viz.: 97 quarters of wheat, 61½ lbs. per bushel, weighing 21'200 tons; 88 ditto tares, beans, and peas, 63 lbs. per bushel, 20 tons; 105 ditto rye, 57 lbs., 21 tons; 108 ditto seed, 52 lbs., 20 tons; 114 ditto barley, 52 lbs., 21 tons; 125 ditto oats, 37 lbs., 16½ tons. [It may be mentioned that formerly, 100 quarters of wheat were considered equal to 10 tons hemp for freight, but about the year 1828, the *Imperial* superseded the old *Winchester* measure, and

is 3 $\frac{1}{2}$ cent. larger; hence 97 quarters are now quoted, where it was formerly 100 quarters.]

68.47 quarters of wheat, weighing 61 $\frac{1}{2}$ lbs. $\frac{1}{2}$ bushel, will require a stowage in bulk equal to 15 tons measurement of 40 cubic feet equal to 600 cubic feet. A vessel of 245 tons register will ordinarily carry 1,678 quarters of wheat, 1,552 quarters of beans, or 2,108 quarters of oats. A vessel of 203 tons will carry 50 tons of iron and 1,160 quarters of wheat. The stowage of 100 quarters of wheat is generally considered as about equal to 21 tons of coal. A good carrying ship will stow 50 to 60 quarters barley to every 10 tons dead-weight.

Tonnage for Freight. The Admiralty rates 5 quarters of wheat in sacks, 48 bushels of bran, and 48 ditto of pollard to a ton; on the Crinan Canal 5 quarters of wheat, rye, peas, beans, and tares go for a ton; 5 $\frac{1}{2}$ of barley; and 6 of bear or bigg; Bengal Madras, and Bombay wheat 20 cwt.; Bengal and Madras peas 20 cwt. In Australia grain is usually freighted @ $\frac{1}{2}$ bushel; at New York 22 bushels of grain, peas, or beans, in casks, or 36 bushels in bulk go to a ton; at Baltimore 22 in casks, 40 in bulk—5 bushels of grain are estimated at a standard of 5 cubic feet.

Rates for Freight. Grain, seed, &c., pay freight according to their respective weights, as compared with that of wheat, viz.: beans pay 10 $\frac{1}{2}$ cent. more, linseed 10 $\frac{1}{2}$ cent. less, rye 7 $\frac{1}{2}$ $\frac{1}{2}$ cent. less, barley 15 $\frac{1}{2}$ cent. less; and oats 22 $\frac{1}{2}$ cent. less; rapeseed is computed at 10 $\frac{1}{2}$ cent. less, which is not considered proportionate for vessels under 200 tons register, as they stow and carry nearly as many quarters of wheat or Indian corn as of seed. Over 200 tons the proportion becomes more in favour of 10 $\frac{1}{2}$ cent.

When wheat is freighted at 10s. $\frac{1}{2}$ quarter, beans, peas, and tares are rated at 10s. 9 $\frac{1}{2}$ d., rye 9s. 3 $\frac{1}{2}$ d., linseed 8s. 11d., barley 8s. 6d., and oats 7s. 8 $\frac{1}{2}$ d. The Mediterranean scale says when wheat is 1s., beans, peas, and tares should be 1s. 1 $\frac{1}{2}$ d. $\frac{1}{2}$ quarter, linseed and rapeseed 10 $\frac{1}{2}$ d., rye 11 $\frac{1}{2}$ d., barley 10 $\frac{1}{2}$ d. and oats 9 $\frac{1}{2}$ d.

By the Baltic and Archangel rates 97 imperial quarters of wheat are freighted as being equal to 10 tons of clean hemp; peas, beans, and tares 10 $\frac{1}{2}$ cent. more than freight of wheat, rye, 7 $\frac{1}{2}$ $\frac{1}{2}$ cent., linseed 10, barley 15, oats 22 $\frac{1}{2}$, less than freight of wheat; sowing linseed, 12 barrels in casks, 24 ditto in bulk, equal to 1 ton of Rhine hemp. A Dantzic last of grain is 30 hectolitres=85 bushels=2.66 tons.

When Black Sea tallow is 30s. $\frac{1}{2}$ ton freight, wheat $\frac{1}{2}$ quarter should be 4s. 7 $\frac{1}{2}$ od., linseed 4s. 2.103d., peas, beans, and tares 5s. 1.237d., rye 4s. 3.494d., barley 3s. 11.319d., and oats 3s. 7.144d.

Measures and Packages. An *Admiralty* barrel of peas contains 5 bushels or 319 lbs. net; half-hogsheads 3 $\frac{1}{2}$ bushels or 240 lbs.; and a kilderkin 2 $\frac{1}{2}$ bushels or 161 lbs. 1 cwt. wheat 2.36 cubic feet; barley 2.38; oats 3.64.

Irish grain is usually shipped by the barrel which for wheat weighs 280 lbs. barley 224 lbs., oats 196 lbs.; freight is paid by the quarter. The Glasgow boll of wheat is 240 lbs., barley is 320 lbs., peas and beans 280 lbs., oats 264 lbs., and oatmeal 140 lbs.

Metage. At Hull the charge for metage is 5d. $\frac{1}{2}$ last.

Variety of British Measures. A bushel of wheat at Bridgend is 168 lbs.; at Worcester it is 62 lbs.; at Darlington it is 73 $\frac{1}{2}$ lbs.; at Shrewsbury it is 75 lbs.; at Wolverhampton 72 lbs.; at Monmouth 80 lbs.; at Manchester 60 lbs. if it is

English wheat, 70 lbs. if it is American ; at Carmarthen it is 64 lbs., and at Newcastle 1 lb. less than that quantity. Then, again, a load in one place is not a load in another ; for example, it may signify 5 bushels, or 3, or 40, or 5 quarters, or 448 lbs. or 144 quarts. In other markets it is sold by the quarter of 480 lbs., by the bag of 12 scores, or 11 scores 10 lbs., or 11 scores 4 lbs., or 11 scores. Then, again at Malton it is sold by the "weight," which means there 40 stones, while at Nottingham it is 36, and at Whitehaven only 14. At Swansea we are told they sell it by the "stack" of 3 bushels ; at Barnardcastle by the "boll" of 2, which at Glasgow signifies 240 lbs., and in the case of maize 40 lbs. additional. At Pwllheli they sell by the hobbet of 252 lbs., the same denomination at Wrexham meaning only 168 lbs. At Preston they sell it by the windle, and at Beccles by the coombe ; at Chester by the "measure," and at Holmfirth by the strike. At Dublin it is sold by the barrel, which there means 282 lbs., but at Cork 268 lbs.

The United States standard bushel is called the *Winchester* which is said to contain 2,150.42 cubic inches, or 77.627413 lbs. avoirdupois of distilled water at its maximum density. Its dimensions are 18½ inches diameter inside, 19½ inches outside, 8 inches deep ; and, when heaped, the cone must not be less than 6 inches high, equal to 2,747.70 cubic inches for a true cone. The bushel of the *State of New York* contains 80 lbs. of pure water at its maximum density, or 2,211.84 cubic inches. It is a singular fact that the Philadelphia measures for grain are larger than those for New York, Boston or Baltimore.

GRAIN MEASURES OF VARIOUS FOREIGN PORTS.

ABYSSINIA.—At *Gondar* the ardeb contains 10 madegas ; at *Masuah* (Red Sea) 24 madegas ; about 80 madegas make an English imperial bushel.

AFRICA.—The harbaia about 20½ lbs. ; *Tripoli*, a temen, 6 gallons nearly.

AUSTRIA.—*Vienna*, 4 viertels or 8 achtels=1.69 bushels ; *Trieste*, 3½ stagas make 1 quarter ; 350 starra=100 quarters.

BELGIUM.—*Antwerp*, 1,015 kilos=2,240 lbs., a haster 360 French bushels, a muid=2.7522 bushels, a muke 4½ to 5 gallons ; *Brussels*, a sack 6.90 bushels.

BRAZIL.—15 fanegas=22 bushels.

CANADA.—The minot, an old French measure, 1.0763 imperial bushels, which for all commercial purposes is reckoned at 60 lbs. ; it is calculated by some at about 12½ % cent. larger than a bushel ; 9 minots=1 quarter less 2 % cent. ; 100 minots=13½ quarters ; 7,920 minots=861 quarters.

CANDIA (Mediterranean).—The carga is 4.189 bushels.

CAPE OF GOOD HOPE.—4 schepels=1 muid, 10 muids=1 load, 107 schepels=82 Winchester bushels, or 4 schepels=3 imperial bushels nearly ; the muid of wheat weighs, on an average, 110 lbs. Dutch, somewhat over 119 lbs. English.

DENMARK.—*Copenhagen*, 4 viertels=1 scheffel, 8 scheffels=1 toende or ton, 21 tuns=10 quarters ; some calculate 208 tuns=100 quarters for wheat, and 210 tuns=100 quarters for oats.

EAST INDIES.—*Arabia*, the frasil 18½ to 30 lbs. *Hmboyna*, the coyan 25 piculs or 3,255½ lbs. *Bangalore*, a kist narax-bullah is 2 pucca seers or 4 lbs. 3 oz.

5½ dr.; colaga 11 lbs. 13 ozs. 6½ drs. *Batavia*, a koyan 28 piculs. *Bengal*, a raik, 20 chittacks=2½ lbs., factory maund 74 lbs. 10 oz. 10 dr. *Birma*, a teng about 2 bushels. *Bombay*, candy for grain, seeds, &c.,=8 parahs of 19 lbs. 9 oz. 9½ dr., maund 28 lbs. *Canara*, a colaga a bushel nearly. *Coimbatore*, a bullah 181 cubic inches. *Coromandel*, collum 70 to 80 quarts. *Darraporan*, a bullah 216 cubic inches. *Deccan*, a cossan rather less than 1 lb. the sixtieth part of a carwar. *Java*, a kulach=7½ catties of 46 measures, each of 5 gantangs or about 9·83 lbs.; a koyan 27 piculs or 3,581 lbs., a koizang about 60 bushels. *Madras*, the corn measure contains 80 parahs or 400 marcals, and the marcal 80 puddies or 64 ollocks: the marcal should measure 750 cubic inches, and weigh 27 lbs. 2 oz. 2 dr. avoidupois of fresh spring water; hence 43 marcals=15 Winchester bushels, and therefore the garce=17½ English quarters nearly. When grain is sold by the weight 9,256½ lbs. are reckoned for 1 garce, being 18 candles 12·8 maunds; some reckon the garce at 8,400 lbs., and to contain 80 parahs; a parah equal to 5 marcals, a marcal 8 puddies, and a puddie 8 ollocks. *Malay gantang* 256 cubic inches; 4 chupahs 1 gantang. *Manilla* caban 3½ cubic feet. *Mysore* bullah 4½ lbs. *Nubia* a moud 18 hand full. *Samarang*, a koyan 30 piculs. *Siam*, a sat 3½ lbs. or 3½ pints, a seste 135 lbs. *Seringapatam*, colaga 11 bushels. *Singapore*, a koyan 40 piculs of 133½ lbs. each. *Sooloo and Sunda Isles*, a raga 53½ lbs. *Sumatra*, a nellie consists of 3 bamboos, tenth of the guncha; a culah 0·0618 bush. *Surat*, a maund 41 lbs. The following grain measures are also used in the E. Indies: contagah 98½ cwt., garce 12·8 maunds of 400 marcals=9,256½ lbs. marcal 8 puddies, morau 34·56 cubic inches, moray 38 seers about 1½ bush., ollock 20th of a gallon, punchago 24 cwt. 2 qr. 16 lb., puddie 1½ quarts.

EGYPT.—*Alexandria*, 100 ardebs wheat, Indian corn and barley=63 quarters, a quillot or kisloy five-ninths of a quarter; an ardeb of Egyptian corn 7½ to 9½ bushels, but it varies considerably; 6 waybecks 1 ardeb, 4 roobecks 1 waybeck, 100 ardebs beans=65 qrs. A rhebebe of wheat 4·364 bushels.

FRANCE.—112 lbs.=50½ kilogrammes, 100 litres=1 hectolitre, 2 hectolitres 88 litres=1 quarter, 36 litres=1 bushel; 1 ton 1,015, sometimes 1,018 kilogrammes; a French sack of grain varies from 2·012 to 4·256 bushels. In business the usual calculation is 100 kilos=220 lbs. *Marseilles*, 100 charges=56 quarters wheat. *Havre*, 3 hectolitres=1 quarter adding 4½ cent., 3,355 hectolitres=1,164½ quarters. *Nantes*, 2,064 hectolitres=681½ quarters. *Bordeaux*, 1,830 hectolitres=646½ quarters.

8 bushels Eng.=1 qr.; 11 qr. Eng.=33 hectolitres; 220½ lbs. Eng.=100 kilos.

54 lbs. per bushel equal 67·19 kilos per hectolitre,

55 lbs.	ditto	68·45	ditto
56 lbs.	ditto	69·71	ditto
57 lbs.	ditto	70·97	ditto
58 lbs.	ditto	72·23	ditto
59 lbs.	ditto	73·50	ditto
60 lbs.	ditto	74·77	ditto
61 lbs.	ditto	76·05	ditto
62 lbs.	ditto	77·30	ditto
63 lbs.	ditto	78·58	ditto

GERMANY.—A gescheid 3 to 3½ pints, a foudre about 7½ quarters; *Bremen*, *Hanover*, 10 scheffels=1 wisp, 2 wisp=1 last, 1 last=11½ quarters wheat or

11 quarters barley; 51 lasts 12 scheffels wheat=513½ quarters. *Emden*, 1 last beans 10½ quarters, 38 lasts 417½ quarters. *Weismar*, 70 lasts wheat 933½ quarters, 26 lasts oats 345 quarters. *Lubeck*, 4 fass of grain is equal to 1 scheffel 0·92 bushels, 4 scheffels 1 tonne 3·68 bushels, 3 tonnen 1 drömt 11·04 bushels or 1·38 quarters, and 8 drömt 1 last 88·32 bushels or 11·04 quarters, 96 scheffels=111¼ quarters 67 lasts 787½ quarters. *Hamburg*, last of wheat, peas, beans=11½ quarters, barley 10½, some say 11½ quarters, oats 10½ quarters; 10 lasts are equal to 108·8 quarters, the last is divided into 60 fuss. *Rostock*, last 96 scheffels, equal to 13 quarters; some say oats 14½ quarters, other grain 14 quarters; another authority gives for oats 14½ quarters, other grain 14 quarters; another authority gives for oats 14 quarters, wheat 13½, and barley 13½ quarters. *Bremerhaven*, a last is 80·70 bushels Winchester or 10·087 quarters, that is 10 quarters and 0·7 bushels; some calculate a Bremen last of 40 scheffels to be 9½ quarters. *Altona* wheat, a last 11½ quarters nearly, 111 lasts=1,274½ quarters; barley, a last 11½ quarters, 30 last=343½ quarters.

GREECE.—The kila is 0·9152 bushels or 0·1144 quarters; the starco 2·259 bushels; others compute the starco at 3 bachelts=2·33 English bushels; the ancient keramion 8·488 gallons.

HOLLAND.—*Amsterdam*, a last of oats 10 quarters 5½ bushels; in settling for freight rye is considered 20½ ⅞ cent. higher than oats, wheat 30 ⅞ cent. higher, rye 12 ⅞ cent. higher than seeds; a muid 2·752 bushels. *Rotterdam*, a last is 10½ quarters wheat or rye, 10½ barley, 10½ or 10½, 26 lasts=272½ quarters oats; the last of wheat for freight is charged 10 ⅞ cent. higher than that of barley, and the latter 20 ⅞ cent. higher than oats. *Groningen* last oats=10 quarters.

IONIAN ISLES.—At *Santa Maura* a cado 1½, some say 3½ bushels.

ITALY.—The measures vary, a bussolo 0·335 pints, a quataro 1 gallon, scorzo 3 gallons nearly, moggio 2 quarters nearly, some places 4 bushels only, a rubbio about 8 bushels, 10½ rubbio=100 quarters in *Ancona*; centinajo or quintal, *Florence* 75 lbs., *Milan* 220½ lbs.; a starello, *Milan* 2 gallons, *Rome* 4 gallons; at *Naples* 5½ carro=7 quarters. *Venice*, a stajo is equal to 2 bushels and 2·21 gallons imperial, and is taken in commerce at 342 staji to 100 quarters imperial, or 100 staji 28½ quarters, some parts 100 staji 50·2 quarters; (another authority) the moggio is divided into 4 staji 16 quarte or 64 quataroli, the stajo is equal to 2·27 Winchester bushels. *Genoa*, mina 8 quarte or 96 gombette, 1 mina=3½ Winchester bushels nearly, 2½ mina=1 quarter, some say 245 minas and others 248 minas=100 quarters, 100 minas=40½ quarters, 1,400 minas=563½ quarters. *Ancona*, 104½ rubben=100 quarters. A quarter at *Venice* 3½ staji; *Naples* 5½ tomoli, 7,800 tomoli=1,447 quarters; *Leghorn* 4 sacchi; *Palermo* 10 tomoli 5 quarters old measure. *Trieste*, 3½ stara 1 quarter less 1 ⅞ cent.

JERSEY.—19 cabots=1 quarter wheat, 11 cabots 1 quarter barley.

MALTA.—The salma is 7·969 bushels, 101 salma (some say 102 salma) are 100 quarters; another authority says the salma, stricken measure=8·221 Winchester bushels; heap measure is reckoned 15 ⅞ cent. more; the caffise or caffiso from 1 to 2 quarters; 3,099 salmas=3,158½ quarters.

MOLDAVIA.—*Galets* 100 to 101 kilos are 143 quarters.

MOREA.—A bachel is one-third of a staro and is equal to $6\frac{1}{2}$ gallons.

POLAND.—A korsec is $3\frac{1}{2}$ to $3\frac{1}{2}$ bushels corn.

PORTUGAL.—*Lisbon*, the moyo divided into 15 fanegas, 30 alquieres, 240 quartos, 480 selemis, &c.; the moyo=23 Winchester bushels, the quarto $1\frac{1}{2}$ to $3\frac{1}{2}$ gallons. *Viana*, 17 alquieres=1 quarter, 1 moio=3 quarters.

PRUSSIA.—*Dantzic*, *Memel*, *Konigsberg*, *Pillau*, $56\frac{1}{2}$ scheffels are equal to 1 last or from $10\frac{1}{2}$ to $10\frac{1}{2}$ quarters, or 84 to 86 bushels; another authority says, at *Memel* a last= $3\frac{1}{2}$ malters, 60 scheffels, or 240 viertels, or 11 quarters 3 bushels English; for wheat, rye, &c., the last of $56\frac{1}{2}$ scheffels, or 10 quarters 7 bushels English is generally used. A last at *Anclam*, *Barth*, *Wolgast*, and *Stralsund* is 14 quarters wheat, 13 barley, and 14½ oats; at *Berlin* and *Stettin* $13\frac{1}{4}$ quarters; and at *Wismar* $13\frac{1}{4}$ or sometimes 13 quarters; another authority says, at *Stettin* a last is 96 scheffels, which on discharging makes from $14\frac{1}{2}$ to $14\frac{1}{2}$ quarters, and at *Dantzic* a scheffel weighs 1552 bushels; a last is $56\frac{1}{2}$ scheffels or 10 quarters 7 bushels. 60 scheffels are 11 quarters 3 bushels; a *Dantzic* ship-pound is 330 lbs. English; a *Prussian* scheffel $1\frac{1}{2}$ bushels; *Saxony* 3 bushels, *Oldenburg* 0.544 bushels, and *Rostock* 1.070 bushels; *Rostock* last 96 scheffels 13 quarters; a legal *Prussian* scheffel weighs, wheat $85\frac{1}{2}$ lbs., rye $80\frac{1}{2}$, barley 65, oats 45, meal 75, and peas $90\frac{1}{2}$ lbs.; a chalter at *Stettin* is $84\frac{1}{2}$ bushels.

RUSSIA.—2 osmin=1 chetwert, 100 chetwerts=*St. Petersburg* 70, some say 73, 74, *Odessa* 72, and *Archangel* 68, rye 70 quarters; others say Riga wheat and barley are measured 48 loops or loofs to a last, equal nearly to $11\frac{1}{2}$ quarters; a loop being $1\frac{1}{2}$ bushels; rye 45 loops, or $10\frac{1}{2}$ quarters; oats and peas 60 loops or 14 quarters; a Russian ton is 5 chetwerts or about 28 bushels= $17\frac{1}{2}$ cwt. *Libau*, 1 last oats $13\frac{1}{2}$ quarters, 108 lasts 1,492 quarters.

SARDINIA.—The sterello is equivalent to 1 bushel $1\frac{1}{2}$ peck English; the cantarello or quintal is $89\frac{1}{2}$ lbs., at *Cagliari* $93\frac{1}{2}$ lbs.

SICILY.—*Palermo*, 4 salma of 20 tumoli, or 5 salma of 16 tumoli=5 quarters old measure.

SMYRNA, Asia Minor.—1 kilo=1 bushel; 816 kilos=100 quarters.

SOUTH AMERICA.—The fanega ranges in *Chili* from 153 to 200 lbs.; *Central America*, maize 400 lbs.; *Monte Vidio*, $3\frac{1}{2}$ bushels, averaging 5 fanegas to a quarter; *Valparaiso*, the fanega is equal to 1.6 Winchester bushel, or 5 fanegas, 1 Winchester quarter nearly; a fanega of wheat 135 lbs.

SPAIN.—A barchilla (one-twelfth of a cahiz) $2\frac{1}{2}$ to $4\frac{1}{2}$ gallons, a bisaccia is one-fourth of a salma=1.885 bushels, a fanega $1\frac{1}{2}$ to $2\frac{1}{2}$ bushels, 5 fanegas 1 quarter. *Alicante*, cahiz or caffise, containing 12 barchillas, 96 medios, or 192 quartillas; the cahiz is equal to 7 Winchester bushels nearly; at *Cádiz* 12 fanegas 18 bushels; at *Valencia* 100 cahices $70\frac{1}{2}$ quarters; at *Barcelona* 100 cuarteros $24\frac{1}{2}$ quarters; at *Requijada* 5 fanegas wheat=1 quarter less 5 ¢ cent.; 11,045 fanegas=2118½ quarters; at *Santander* 4 fanegas wheat=1 quarter less 4 ¢ cent.; 9,580 fanegas=2,301 quarters; at *Bilboa* $5\frac{1}{2}$ fanegas=1 quarter adding 6 ¢ cent., 11,483 fanegas=2,221 quarters; at *Almeria* 5 fanegas=1 quarter less 7 ¢ cent.; 1,300 fanegas=244 quarters.

SWEDEN.—4 quarto=1 spann, 2 spann 1 tun or barrel; 1 tun=41.16ths English bushels; 18 tuns are 10 quarters; some take $176\frac{1}{2}$ barrels as equal to 100 quarters; lispund weighs from 14 to 18 lbs.

SWITZERLAND.—64 goblets make a sack of corn; the coupe at *Fribourg* 7 gallons, at *Geneva* 17, at *Lyons* 1½ gallons only.

TURKEY —*Constantinople*, 816 kilos=100 quarters, or 100 kilos 12 quarters; 8,680 kilos=1,083½ quarters; a killow contains 2,023 cubic inches or 0·912 bushels; others say the kiloz or killow=0·941 of a bushel, 8½ kislos=1 quarter, 22 okes make a killow, and 4 killows a fortin.

TUSCANY.—A sacca=3 stagi. each of 2 mina, or 4 quarti=about 2 bushels.

UNITED STATES.—A sack of wheat (miller's) 2 weys or 13 tods=364 lbs.; a barrel of corn 5 bushels. Shipments and sales made by 60 lbs. ⅞ bushel or 480 lbs. ⅞ quarter. A barrel of Indian corn contains 3½ Winchester bushels, each weighing about 57 lbs.; a hogshead of Indian meal 800 lbs.

WALLACHIA.—*Ibrail*, 100 kilos=220 quarters; some say 222½, and an experienced London firm, 232 quarters. A few years since a new measure was adopted, viz.: 100 kilos=232 quarters, and the old measure of 100 kilos=222½ quarters abolished. The difference was in the size of the kilo.

REPORT OF THE MEDITERRANEAN AND BLACK SEA FREIGHT COMMITTEE.

The first point which presented itself for consideration was the extent of the proposed movement.

The Committee, considering the interests represented at the meeting of the 13th November, 1862, and in their own body, came to the conclusion that their proceedings should be limited to the trade of the Mediterranean and Black Sea, including the Danube and the Sea of Azov, and adopted the title accordingly, "Mediterranean and Black Sea Freight Committee."

Public attention was then invited, by advertisements in the leading journals of this and foreign countries, to the movement on foot, with a view to obtaining suggestions bearing upon the subject from the various interests concerned.

The Committee thankfully acknowledge the receipt of many such suggestions, which have received due and deserved consideration at their hands during the progress of their deliberations.

Appended to this are the drafts of the charter-party, in form suited to the several ports of shipment, viz.:

No. 1, 2.—From *Odessa* and the Sea of Azov; (No. 2, also No. 4, with the addition of the so-called "Mediterranean clause.")

No. 3, 4.—From *Galatz*, *Ibrail*, &c.

No. 5.—From *Sulina*.

No. 6.—From *Alexandria*.

Which the Committee now submit, with their explanatory remarks.

Although not specifically stated in the formal resolutions passed at the Meeting on the 13th of November, at the Baltic Coffee-house, it was a well understood fact that the great change contemplated was the alteration of the basis for payments of freights from measure to weight; and it is, perhaps, superfluous to add, that the reasons which mainly influenced the demand for this change of basis were—*firstly*, to assimilate the mode of paying freights to that which regulates the sale of all grain and seed in the United Kingdom and Continent, viz., weight; *secondly*, to render thereby the interests of shipowner and captain

identical with that of the merchant in securing an accurate return of the cargo discharged; and, *thirdly*, to avoid the very frequent disputes and causes of dissatisfaction arising out of the present system, which are patent alike to merchant and shipowner, and therefore need not be more particularly entered upon.

As a weight the Committee have fixed upon the British ton of 2,240 lbs. or 1,015 kilograms. It was obviously impossible to arrive at any weight which should approximate closely to the imperial quarters of wheat from all parts of the Mediterranean and Black Sea, because, from Egypt for instance, the weight is 440 lbs. per average quarter, while from the Black Sea in certain seasons (in the present for instance), a weight of 504 lbs. has been attained. Hence no weights could be said to approximate closely to the imperial quarter. The ton of 2,240 on the other hand, is a standard of weight for almost all merchandise, and is most in use for calculation of freight from all parts of the world; it cannot, therefore, be objectionable in reference to grain; and if it should not come to pass that the ton weight be constituted a standard weight for the sale of grain in all parts of the United Kingdom, as it already is in many parts of Ireland, the reduction of that weight to any other is a simple process, void of intricacy.

As the standard article for regulating charters, the Committee name wheat, as being of foremost importance in the trade of the ports interested, and therefrom have attempted to arrange a scale of proportions for other grain, seed, &c., as appears to them, after due inquiry, founded upon justice to the shipowner, and, therefore, deserving of acceptance by the merchant. It is as follows:—

WHEAT to pay per ton of 2,240 lbs.

	TO PAY
INDIAN CORN	Same
BEANS (Sicilian excepted)	freight as wheat
TARES, LENTILS, PEAS, MILLET SEED	per ton.
DARI and RYE.....	2½ ¢ cent. more.
LINSEED and RAPESEED.....	7 ditto
BARLEY	17 ditto
COTTON SEED	22 ditto
OATS	37 ditto
TALLOW	39 ditto
WOOL (except Merino and so-called "Spanish Wool").....	282 ¢ cent. or 2½ times freight of tallow.
WOOL (Merino and so-called "Spanish Wool")	386 ¢ cent. more than wheat ¢ ton or 3½ times freight tallow.

And other articles not enumerated in this scale, to be computed according to the London Baltic printed rates in proportion to tallow, as fixed by this scale; and on other articles, not enumerated in either scale, freight to be paid as if laden with wheat.

The alterations here made are mainly an increase, more or less important, on the rates payable upon the lighter kinds of grain and seed in proportion to wheat, as compared with the Baltic rates; and in the Appendix will be found a table illustrative of the changes proposed, with the results attained by this scale, and by that of the Baltic printed rates, as nearly as it is possible to estimate the average carrying power of vessels of the present day for lighter grain as compared with wheat.

The Committee have been at great pains to arrive at an accurate judgment on this important point. The enquiry is beset with vast difficulties of a practical kind—among others, the great apparent discrepancies in the carrying power of vessels of different countries and build, exhibited by the returns obtained from importing houses here; but notwithstanding these difficulties, the Committee are confident that the adjustment they have effected will prove to be as close an approximation to fairness as it is in their power to devise.

The Committee are well aware that instances can be adduced where the proposition they submit can be proved to operate unfavourably upon vessels carrying lighter grain than wheat, according to the scale, but these will be quite exceptional instances; and as it is only possible to deal with such questions upon a broad and comprehensive basis, they confidently hope their efforts will be received and acknowledged by the shipping community as a satisfactory effort to correct injustices sustained under the terms of the "London and Baltic printed rates."

The foregoing remarks apply to grain and seed. It will be obvious that the most important alterations effected regard linseed and barley. Convinced that linseed at a reduction of 10 $\frac{1}{2}$ cent. from wheat, and barley at 15 $\frac{1}{2}$ cent. operated unfairly to the shipowners, the Committee have corrected it by decreasing the proportion to 6 $\frac{1}{2}$ cent. on linseed and 12 $\frac{1}{2}$ cent. on barley.

Tallow retains its proportion to wheat as recognised by the Baltic scale.

Wool is subjected to a revision by distinguishing fine wool from coarse. It has been found that by the Baltic scale, whereas coarse wool was loaded at a great advantage to the shipowner as compared with grain, fine wool so loaded proved less remunerative, and even disadvantageous to the shipowner; therefore, by the present scale it has been resolved to decrease the rate on coarse wool to $2\frac{1}{2}$ times the rate on tallow, and on merinos to increase the rate to $3\frac{1}{2}$ times.

The question of press packing of wool was brought to the notice of the Committee, whereby a great saving in freight might be effected by the merchant without detriment to the shipowner; but the difficulties which at present encompass the carrying out of such an arrangement are such, that the Committee conceive any suggestion with reference thereto, at this moment, would be of little or no service.

Beside the alteration of the scale, it appeared to the Committee that various alterations might be made with advantage in the form of charter-party to which they will now allude.

It was conceived that charterers have a right to an accurate statement of the class and capacity of ships to be chartered, and with that view have introduced a clause which will give these particulars the nature of a warranty.

At the recommendation of the shipowners on the Committee, and after consulting with parties interested in the question, it was resolved to add Plymouth as a third Port of Call, with Falmouth or Queenstown, for the convenience of vessels, because it is an ascertained fact that in unfavourable weather Plymouth can mostly be reached, when Falmouth or Queenstown are difficult of access.

The question of the so-called "afloat clause" has often given rise to dispute and difficulty, and although practically no vessel can be compelled to lie otherwise than afloat, under the terms "as near as she may safely get" the Committee resolve to terminate the doubt by inserting the clause to discharge afloat, and so to end all misunderstanding on that point.

The additional rate of 10 $\frac{1}{2}$ cent. for discharge on the Continent between Havre and Hamburg, is clearly unfair in principle, inasmuch as while the extra

charges must always be the same at any given port, the additional rate obtained varies with the rate of freight paid for the voyage—to the advantage of the merchant if at a low freight, to that of the owner if at a high freight. The Committee have, therefore, stipulated that freight to the Continent shall be 3s. 6d. $\frac{1}{2}$ ton wheat additional for all charters, considering that thereby they give the shipowner a fair remuneration for the excess of charges incurred.

They also give an allowance of 1s. 6d. $\frac{1}{2}$ ton wheat for the advantage of direct destination, on signing bills of lading, or for discharge at the Port of Call, considering that the owner has an advantage fully to this extent in so curtailing the time occupied in the voyage.

The allowance of discount on half freight has been expunged. Seeing that this allowance is in but very few cases to the benefit of the charterer, the Committee consider that it might fairly be remitted to the shipowner, and the freight paid in full without deduction.

As to lay-days, it is thought well that the expenditure of time at any Port of Call arranged by charter, shall reckon with days used in loading and discharging, and in that way more promptitude will be observed on the part of merchants. The additional to days for wool appear to be amply warranted. This clause has been inserted in the Danube charters in view of the increasing exports of that article from this quarter.

Disputes are of frequent occurrence as to the exact place of loading at the Sulina Mouth of the Danube, and also as to the reading of the ice clause, for vessels loading at Sulina. Charter No. 5 contains clauses on these points which it is considered will meet the existing difficulties in a satisfactory manner.

The Committee have come to the conclusion that a *pro rata* amount of demurrage offers a fairer settlement of that point than the present mode, causing at times a question in the framing of charters which may well be dispensed with. The amount which the Committee recommend is 4d. $\frac{1}{2}$ register ton British measurement, per day, which, from inquiry, they find to be in general use for Government charters, and appears equitable.

The payment of freight by weight allows the Committee to do away with the most objectionable part of the so-called "damage clause." They propose that *sea-damaged* grain or seed shall pay two-thirds the freight of sound, except in cases of stranding. They except stranding, because in that case, and in no other, can merchants at present recover the loss involved in damage by sea-water; and although in rare cases sea damage incurred may be quite beyond the control of the shipowner or captain, still the clause will have the very natural effect of insuring greater care of the cargo on the part of captains.

SUCH are the changes suggested by the Committee. It may not be out of place to say that the task committed to them has been performed with much serious consideration, and no small amount of labour—that they have endeavoured faithfully to discharge their duty to all interests concerned, it is hoped the report they to-day put forward will fully establish.

MAJOR USBORNE, *Chairman.*
HENRY F. TIARKS, } *Hon. Secs.*
ALBERT KAHL,

Baltic Coffee-house, London, March, 1863.

FORMS OF CHARTER-PARTY.

CHARTER-PARTY, No. 1.—From Odessa and the Sea of Azov.

LONDON,

186

It is this day mutually agreed between of the good ship or vessel called the of of the burthen of tons register admeasurement, or thereabouts, whereof is Master, now and of Merchants. That the said ship being tight, staunch, and strong, classed and every way fitted for the voyage, shall with all convenient speed sail and proceed to CONSTANTINOPLE, and there apply to Messrs. who shall give orders, within twenty-four hours after application (if in ballast, or after discharge of inward cargo, if any), or lay-days to count, to proceed to ODESSA or KERTCH, or so near thereto as she can safely get, and if ordered to Kertch, shall either load there or proceed, agreeably to further orders to be there given on arrival, or lay-days to count, to TAGANROG, or a SAFE PORT IN THE SEA OF AZOV, or so near thereto as she may safely get, and there load from the Agents of the said Charterers, a full and complete cargo, but not exceeding tons, of wheat and or other lawful merchandise, at the option of the Merchants, which the said Merchants bind themselves to ship and send alongside at the Port of Loading, and take from alongside at the Port of Discharge, at their own expense and risk—the ship's boats and crew to render the customary assistance in towing the lighters—not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions, and furniture; and being so loaded, shall there-with proceed to QUEENSTOWN, FALMOUTH, or PLYMOUTH, at the Master's option, for orders (to be given by return of Post or lay-days to count) to discharge at a SAFE PORT IN THE UNITED KINGDOM, or ON THE CONTINENT between HAVRE AND HAMBURG inclusive, or so near thereunto as she may safely get, and there deliver the same afloat on being paid freight in cash, without discount as follows:—

For WHEAT \pounds ton of 2,240 lbs. or 1,051 kilograms gross weight, delivered from

ODESSA OR KERTCH			SEA OF AZOV					
\pounds	s.	d.	\pounds	s.	d.	\pounds	s.	d.
other lawful merchandise in proportion thereto, according to the Mediterranean and Black Sea Freight Scale of 1863, being in full of all Primages, Port Charges, and Pilotage. If the vessel be discharged on the continent as above, the rate shall be three shillings and sixpence per ton additional, and if the vessel be ordered to a direct port on signing Bills of Lading, or if she be discharged at her Port of Call, the rate shall be reduced by one shilling and sixpence per ton, Cork being considered for vessels calling at Queenstown as the Port of Call. The Merchants engage to provide mats, and the ship the necessary wood for Dunnage. Cash for ship's disbursements at the Port of Loading not to exceed \pounds , to be advanced, free of interest and commission, and to be deducted from the freight with cost of insurance thereon.								

running days are to be allowed the said Merchants for loading the said ship, waiting orders and unloading, and if one half or more of the cargo consist of wool, 10 additional days to be allowed; and 10 days on Demurrage over and above the said laying-days, at fourpence per register ton British measurement per day, to be paid day by day. Detention by ice and quarantine not to be counted as lay-days. (The act of GOD, the Queen's enemies, restraints of Princes,

Pirates, fire, and all and every other dangers and accidents of the seas, rivers, and navigation, of what nature and kind soever during the said voyage, being always excepted).

It is also agreed, that should the cargo consist of grain or seed, and any part thereof be delivered damaged by sea-water, the Freight upon such sea-damaged portion shall be two-thirds of that above stipulated, except only in case the vessel shall have been stranded.

The Charterer's liability on this Charter to cease when the cargo is shipped, provided the same is worth the Freight on arrival at Port of Discharge, the Owner, Master, or his Agents having an absolute lien on it for Freight, Dead Freight and Demurrage.

Penalty for non-performance of this agreement, the estimated amount of Freight.

CHARTER-PARTY, No. 2.—*Sea of Azov, with additional clause.*

After being loaded, *the ship is to call at Malta for orders*, the Charterers or their Agents having the option, within twenty-four hours after arrival, or lay-days to count, of ordering her on as above, *or to a safe port in the Mediterranean to discharge*, paying, in the latter case, of the Freight agreed for the United Kingdom, and so end the voyage.

Witness,

CHARTER-PARTY, No. 3.—*Galatz, Ibrail, &c.*

LONDON,

186

It is this day mutually agreed between of the good ship or vessel called the of the burthen of tons register admeasurement, or thereabouts, whereof is Master, now and of Merchants. That the said ship being tight, staunch, strong, classed and every way fitted for the voyage, shall, with all convenient speed sail and proceed to GALATZ for orders, to be given within twenty-four hours after arrival, or lay-days to count, to load there, or at Ismail or any other safe port in the River Danube (not higher than Ibrail), or so near thereunto as she may safely get, and there load from the Agents of the said Charterers, a full and complete cargo, but not exceeding tons, of wheat and other lawful merchandise, at the option of the Merchants, which the said Merchants bind themselves to ship and send alongside at the Port of Loading, and take from alongside at the Port of Discharge, at their own expense and risk—the ship's boats and crew to render the customary assistance in towing the lighters—not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions, and furniture; and being so loaded, shall therewith proceed to QUEENSTOWN, FALMOUTH, or PLYMOUTH, at the Master's option, for orders (to be given by return of post or lay-days to count) to discharge at a SAFE PORT IN THE UNITED KINGDOM, or ON THE CONTINENT between HAVRE AND HAMBURG, inclusive or so near thereunto as she may safely get, and there deliver the same afloat on being paid freight in cash, without discount as follows :—

For WHEAT $\frac{7}{8}$ ton of 2,240 lbs. or 1,015 kilograms }
gross weight, delivered,

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other lawful merchandise in proportion thereto, according to the Mediterranean and Black Sea Freight Scale of 1863, being in full of all Primages, Port Charges, Pilotage, Lighterage at Sulina, &c. If the vessel be discharged on the continent as above, the rate shall be three shillings and sixpence per ton additional, and if the vessel be ordered to a direct port on signing Bills of Lading, or if she be discharged at her Port of Call, the rate shall be reduced by one shilling and sixpence per ton, Cork being considered for vessels calling at Queenstown as the Port of Call. The Merchants engage to provide mats, and the ship the necessary wood for Dunnage. Cash for ship's disbursements at the Port of Loading not exceeding £ , to be advanced, free of interest and commission, and to be deducted from the freight with cost of insurance thereon.

running days are to be allowed the said Merchants for loading the said ship, waiting orders and unloading, and if one half or more of the cargo consist of wool, 10 additional days to be allowed; and 10 days on Demurrage over and above the said laying-days, at fourpence per register ton British measurement per day, to be paid day by day. Detention by ice and quarantine not to be counted as lay-days. (The act of GOD, the Queen's enemies, restraints of Princes, Pirates, fire, and all and every other dangers and accidents of the seas, rivers, and navigation, of what nature and kind soever, during the said voyage, being always excepted.)

It is also agreed, that should the cargo consist of grain or seed, and any part thereof be delivered damaged by sea-water, the Freight upon such sea-damaged portion shall be two-thirds of that above stipulated, except only in case the vessel shall have been stranded.

The Charterer's liability on this Charter to cease when the cargo is shipped provided the same is worth the Freight on arrival at Port of Discharge, the Owner, Master, or his Agents having and absolute lien on it for Freight, Dead Freight and Demurrage.

Penalty for non-performance of this agreement, the estimated amount of Freight.

CHARTER-PARTY, No. 4.—Galatz, Ibrail, &c.—additional clause.

After being loaded, *the ship is to call at Malta for orders*, the Charterers or their Agents having the option, within twenty-four hours after arrival or lay-days to count, of ordering her on as above, *or to a safe port in the Mediterranean* to discharge, paying, in the latter case, of the freight agreed for the United Kingdom, and so end the voyage.

Witness,

CHARTER-PARTY, No. 5.—From Sulina.

LONDON,

186

It is this day mutually agreed between of the good ship or vessel called the of the burthen of tons register admeasurement, or thereabouts, whereof is Master, now and of Merchants. That the said ship being tight, staunch, and strong, classed and every way fitted for the voyage, shall, with all convenient speed sail and proceed to the SULINA MOUTH OF THE DANUBE, or so near thereunto as she can

safely get, and there load, always afloat, from the Agents of the said Charterers, a full and complete cargo, but not exceeding tons, of wheat and or other lawful merchandise, at the option of the merchants, which the said Merchants bind themselves to ship and send alongside at the Port of Loading, and take from alongside at the Port of Discharge, at their own expense and risk, not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions, and furniture; and being so loaded, shall therewith proceed to QUEENSTOWN, FALMOUTH, or PLYMOUTH, at the Master's option, for orders (to be given by return of post or lay-days to count) to discharge at a SAFE PORT IN THE UNITED KINGDOM, or ON THE CONTINENT BETWEEN HAVRE AND HAMBURG inclusive, or so near thereunto as she may safely get and there deliver the same afloat on being paid Freight in cash, without discount, as follows :

For WHEAT, per ton of 2,240 lbs. or of 1,015 kilograms }
gross weight delivered, }

other lawful merchandise in proportion thereto, according to the Mediterranean and Black Sea Freight Scale of 1863, being in full of all Primages, Port Charges, and Pilotage. If the vessel be discharged on the Continent as above, the rate shall be three shillings and sixpence per ton additional, and if the vessel be ordered to a direct Port on signing Bills of Lading, or if she be discharged at her Port of Call, the rate shall be reduced by one shilling and sixpence per ton, Cork being considered for vessels calling at Queenstown as the Port of Call. The Merchants engage to provide mats, and the ship the necessary wood for dunnage. Cash for ship's disbursements at the Port of Loading, not exceeding £ to be advanced, free of interest and commission, and to be deducted from the Freight with cost of insurance thereon.

running days are to be allowed the said Merchants for loading the said ship, waiting orders and unloading, and if one half or more of the cargo consist of wool, 10 additional days to be allowed; and 10 days on demurrage over and above the said laying-days at fourpence per register ton British measurement per day, to be paid day by day. If the loading of the ship at Sulina be prevented by ice in the Danube either at or below Ibrail, lay-days shall not reckon during the delay so occasioned. (The act of GOD, the Queen's enemies, restraints of Princes, Pirates, fire, and all and every other dangers and accidents of the seas, rivers, and navigation, of what nature and kind soever, during the said voyage, being always excepted.)

It is also agreed, that should the cargo consist of grain or seed, and any part thereof be delivered damaged by sea-water, the Freight upon such sea-damaged portion shall be two-thirds of that above stipulated, except only in case the vessel shall have been stranded.

The Charterer's liability on this charter to cease when the cargo is shipped, provided the same is worth the freight on arrival at Port of Discharge, the Owner, Master, or his Agents having an absolute lien on it for Freight, Dead Freight, and Demurrage.

Penalty for non-performance of this agreement, the estimated amount of Freight.

NOTE.—The Freight from Sulina is generally 3*d*. a quarter higher than that from Kustendje, on account of the difference in Port Charges, &c.

CHARTER-PARTY, No. 6.—**Alexandria.**

LONDON,

186

It is this day mutually agreed between of the good ship or vessel called the of of the burthen of about tons register admeasurement, or thereabouts, whereof is Master, now and of Merchants. That the said ship being tight, staunch, and strong, classed and every way fitted for the voyage, shall, with all convenient speed, sail and proceed to ALEXANDRIA (Egypt), or so near thereunto as she may safely get and there load from the Agents of the said Charterers, a full and complete cargo, but not exceeding tons of wheat or other lawful merchandise, at the option of the Merchants, which the said merchants bind themselves to ship and send alongside at the Port of Loading, and take from alongside at the Port of Discharge, at their own expense and risk, not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions and furniture; and being so loaded, shall therewith proceed to QUEENSTOWN, FALMOUTH or PLYMOUTH, at the Master's option, for orders (to be given by return of post, or lay-days to count) to discharge at a SAFE PORT IN THE UNITED KINGDOM, or ON THE CONTINENT BETWEEN HAVRE AND HAMBURG, inclusive, or so near thereunto as she may safely get, and there deliver the same afloat on being paid freight in cash, without discount, as follows:—

For Wheat, per ton of 2,240 lbs. or of 1,015 kilograms }
gross weight delivered,

other lawful merchandise in proportion thereto, according to the Mediterranean and Black Sea Freight Scale of 1863, being in full of all Primages, Port Charges, and Pilotage. If the vessel be discharged on the Continent as above the rate shall be three shillings and sixpence per ton additional, and if the vessel be ordered to a direct port on signing Bills of Lading, or if she be discharged at her Port of Call, the rate shall be reduced by one shilling and sixpence per ton, Cork being considered for vessels calling at Queenstown as the Port of Call. The Merchants engage to provide mats, and the ship the necessary wood for dunnage. Cash for ship's disbursements at the Port of Loading, not exceeding £ , to be advanced, free of interest and commission, and to be deducted from the Freight with cost of insurance thereon.

running days are to be allowed the said merchants for loading the said ship, waiting orders and unloading, and 10 days on Demurrage over and above the said laying-days, at fourpence per register ton British measurement per day, to be paid day by day. (The act of GOD, the Queen's enemies, restraints of Princes, Pirates, fire, and all and every other danger and accidents of the seas, rivers, and navigation, of what nature and kind soever, during the said voyage, being always excepted.)

It is also agreed, that should the cargo consist of grain or seed, and any part thereof be delivered damaged by sea-water, the Freight upon such sea-damaged portion shall be two-thirds of that above stipulated, except only in case the vessel shall have been stranded.

The Charterer's liability on this Charter to cease when the cargo is shipped, provided the same is worth the Freight on arrival at the Port of Discharge, the Owner, Master, or his Agents having an absolute lien on it for Freight, Dead Freight and Demurrage.

Penalty for non-performance of this agreement, estimated amount of freight.
Witness,

MARCH,] **ANGIER'S FORM OF CHARTER-PARTY.**

[1870.

LONDON,

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It is this day mutually agreed between of the good ship or vessel called the of the burthen of or thereabouts, whereof is Master ; now and of Merchants. That the said ship being tight, staunch, and strong, classed and every way fitted for the voyage, shall, with all convenient speed, after ending her intermediate voyages as above sail and proceed to CONSTANTINOPLE, and thence as ordered, to SULINA or KUSTENDJE, or one safe usual loading place between KUSTENDJE and CONSTANTINOPLE inclusive, GALATZ, for orders to load there or at ISMAIL or one other safe usual loading place in the Danube, not above IBRIAL, (orders as above to be given within twenty-four hours after application if in ballast, or before final delivery of cargo, if any, or lay-days to count). Or so near thereto as she may safely get and there load from the agents of the said charterers, a full and complete cargo of wheat or other grain or seed, and (or) other lawful merchandise, at the option of the merchants, which the said merchants bind themselves to ship and send alongside at the port of loading, and take from alongside at the port of discharge, at their own expense and risk—the ship's boats and crew to render the customary assistance in towing the lighters—not exceeding what she can reasonably stow and carry over and above her tackle, apparel, provisions, and furniture ; and being so loaded shall therewith proceed to MALTA for orders (which are to be given within hours of arrival, or lay-days to count,) to proceed to a safe port in the MEDITERRANEAN as far as MARSEILLES inclusive, or as far as GIBRALTAR or to CADIZ or LISBON ; or to QUEENSTOWN, FALMOUTH, or PLYMOUTH, at the master's option, for orders (to be given by return of post, or lay-days to count) to discharge at a SAFE PORT IN THE UNITED KINGDOM or ON THE CONTINENT BETWEEN HAVRE AND HAMBURG, inclusive, or so near thereunto as she may safely get, and there deliver the same always afloat on being paid freight in cash, (if abroad at current exchange, or at captain's option by good and approved bills on London,) without discount, as follows :—

For WHEAT per ton of 2,240 lb. or 1,015 }
 kilogrammes gross weight delivered } From |

Other grain or seed, or lawful merchandise in proportion thereto, according to the Mediterranean and Black Sea freight scale of 1863 ; being in full of all primages, port charges and pilotage. If the vessel be discharged on the Continent as above, the rate shall be three shillings and sixpence per ton additional, and if the vessel be ordered to a direct port on signing bills of lading, or if she be discharged at her port of call the rate shall be reduced by one shilling and sixpence per ton, Cork being considered for vessels calling at Queenstown as the port of call. The merchants engage to provide mats and the ship the necessary wood for dunnage. Cash for ship's disbursements at the port of loading, not exceeding £ the exchange of ninety-five Galatz piastres per £ to be advanced, free of interest and commission, and to be deducted from the freight with cost of insurance thereon.

running days (such days not to count before unless both ship and cargo be ready earlier), are to be allowed the said merchants for loading the said ship and unloading, commencing from the time of the ship being ready to take in and deliver cargo respectively, and ten days on demurrage over and above the said laying days, at per day, to be paid day by day. Detention

by ice in the Danube, from Braila downward, or by frost, or snow, or accident on the Railway, and quarantine not to be counted as lay-days. (The act of GOD, the Queen's enemies, restraints of princes, pirates, fire, and all and every other dangers and accidents of the seas, rivers, and navigation, of whatever nature and kind soever, during the said voyage being always excepted). It is also agreed that should the cargo consist of grain or seed, and any part thereof be delivered damaged by sea-water, the freight upon such sea-damaged portion shall be two-thirds of that above stipulated, except only in case the vessel shall have been stranded. If loaded at Sulina the vessel to take in as much inside the bar as will admit of her crossing the bar safely, the balance to be sent alongside the ship in the roads at merchant's risk and expense, the ship to pay the Sulina dues. Detention by bad weather preventing lighters coming alongside the ship not to count as lay-days. The charterer's liability on this charter to cease when the cargo is shipped, provided the same is worth the freight, &c. on arrival at port of discharge; the owner, master, or his agents having an absolute lien on it for freight, dead-freight, and demurrage, and power to demand payment in advance or on delivery of each portion of the cargo. The vessel to be addressed at port of loading to charterers' agents, paying $2\frac{1}{2}$ per cent. commission. Five per cent. commission is due by the ship on the amount of freight to Messrs. ANGLIER BROTHERS, 69, Cornhill. The ship to be reported at the Custom-house, London, by

Penalty for non-performance of this agreement, the estimated amount of freight.

Witness,

Witness,

WEIGHT OF WHEAT, &c., PER BUSHEL.

(See also page 248, Elsinore.)

Wheat.

ENGLISH WHEAT, according to seasons	lb. lb.	56 to 66
BALTIC AND DANISH PORTS, Hamburg, Bremen, Antwerp, &c., after a very fine harvest, 62 to 64 lbs.	generally	58 ,, 64
If the harvest be wet and the grain sprouted 56 to 58 lbs. is about the weight even when dried—if not dried, it is unfit for shipment.		
BRITTANY AND NORMANDY		57 to 61
FRENCH BAY OF BISCAY ...		59 ,, 64
SPANISH BAY OF BISCAY, sometimes 63 lbs., generally		60 ,, 62
ADRIATIC GULF, -- Fiume, Ancona, Romagna, &c. ...		60 ,, 64
BLACK SEA WHEAT from Marionople, Berdianski, Odessa, and Danubian ports		56 ,, 63
TAGANROG HARD WHEAT and other hard wheat		60 ,, 66
SMYRNA HARD WHEAT.....		59 ,, 63
AMERICAN AND CANADIAN weighs from		56 ,, 64
NEW BRUNSWICK		60 ,, 61
AUSTRALIAN is frequently very heavy		62 ,, 66
ADELAIDE, plains 63 lbs. hills Exhibitions 66 and 68 lbs.		64
EAST INDIAN		60 ,, 63
EGYPTIAN is always light, varies much in weight, being more or less weevil-eaten, in this state it may weigh		45 ,, 55
If perfectly sound it may weigh		55 ,, 59
INDIAN CORN OR MAIZE, from Black Sea ports, will weigh, if free from weevil... ..		58 ,, 62
Sometimes		63
Egyptian		55 ,, 65
— Dari		52 ,, 65
American horse tooth or flat maize, 54 to 59 lbs., round		59 ,, 61
New Brunswick		49 ,, 51
Spanish, American, and other yellow corn weighs heavier than white. Yellow, white and Western mixed Indian corns are quoted in New York prices current @ 56 lbs.		

Barley.

ENGLISH, from Norfolk generally the heaviest	lb. lb.	53 to 55
Other English and Irish ...		50 ,, 53
Scotch		52 ,, 55
SAALE, from Hamburg		50 ,, 53
DANISH ISLANDS.....		47 ,, 55
STETTIN BARLEY and Bere		49 ,, 53
SMYRNA		45 ,, 49
SYRIAN AND EGYPTIAN.....		44 ,, 46
French, Bay of Biscay, &c.		48 ,, 53
NEW BRUNSWICK		49 ,, 51
AFRICAN		44 ,, 46

Bigg.

SCOTCH	46 ,, 48
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Oats.

IRISH	35 ,, 42
Sometimes	44
DUTCH	38 ,, 43
DANISH AND DUTCH black	36 ,, 43
DANISH	36 ,, 42
DANISH ISLANDS, yellow ...	42
DUTCH AND EMDEN, yellow	44
RIGA	37 ,, 39
ARCHANGEL.....	34 ,, 37
NEW BRUNSWICK	38
Sometimes best black ...	42
And best white	47

Peas and Beans.

PEAS AND SMALL PIGEON BEANS weigh usually.....	62 ,, 66
LARGE BEANS	56 ,, 61
EGYPTIAN BEANS	54 ,, 63

A BUSHEL. The imperial corn bushel is 218'192 cubic inches, which multiplied by 776 the number of bushels in 97 quarters of wheat, and divided by 1,728 cubic inches in a foot, gives 996 cubic feet, which through stowage in the hold is reduced to 850 cubic feet or 1 keel. It is stated that if a bushel be filled with wheat slowly and from a height, the contents will weigh 2 lbs. more than if filled rapidly from its edge.

MASTERS are recommended when loading to have the fair average weight of a bushel of sound grain recorded and certified. They could then compare this weight with that of a bushel of any portion of the cargo which had during the passage become damaged or unsound, and thus more readily come to an arrangement for the settlement of freight in case of dispute.

MARCH.]

ANGIER BROTHERS' COMPARATIVE RATES OF FREIGHT.—BLACK SEA, &c.

[1870.

OLD BALTIC SCALE.

MEDITERRANEAN AND BLACK SEA FREIGHT SCALE OF 1863.

Tallow. ¢ ton.	WHEAT THE STANDARD.			Tallow. ¢ ton.	Eye. ¢ ton.	Lined AND Rapese'd		Barley.		Cotton Seed. ¢ ton.	Oats. ¢ ton.	Wool	
	Wheat. ¢ imp. quarter, or 480 lbs.	¢ ton.	¢ 4.	¢ 492 lbs.		¢ ton.	¢ ton.	¢ ton.	¢ 400 lbs.			COARSE. ¢ ton.	FINE. ¢ ton.
.346	.054	0	3	.055	.348	.256	.293	.052	.805	.843	.958	1-911	1-216
1-089	.107	0	6	.110	.695	.512	.585	.157	.610	.685	1-911	2-452	2-452
1-286	.161	0	9	.165	1-043	.769	.802	.157	.915	1-027	2-867	3-649	3-649
3-464	.214	1	0	.220	1-390	1-025	1-070	.209	1-220	1-370	3-822	4-865	4-865
13-857	.536	2	6	.549	3-475	2-562	2-675	.522	3-060	3-425	9-556	12-162	12-162
27-715	2-143	10	0	2-196	13-900	10-250	10-700	11-700	2-089	13-700	38-225	48-650	48-650
29-101	4-236	20	0	4-398	27-800	20-500	21-400	23-400	24-400	27-400	76-450	97-900	97-900
30-486	4-500	21	0	4-613	29-190	21-525	22-470	24-570	25-620	28-770	80-372	102-165	102-165
31-179	4-714	22	0	4-832	30-580	22-550	23-540	25-740	26-840	30-140	84-095	107-080	107-080
31-872	4-821	22	6	4-942	31-275	23-062	24-075	26-345	27-450	30-825	86-006	109-462	109-462
33-268	4-929	23	0	5-062	31-970	23-575	24-610	26-910	28-060	31-510	87-918	111-895	111-895
34-643	5-143	24	0	5-271	33-360	24-600	25-680	28-080	29-280	32-880	91-740	116-760	116-760
36-929	5-357	25	0	5-491	34-750	25-625	26-750	29-250	30-500	34-250	95-562	121-625	121-625
37-415	5-571	26	0	5-711	36-140	26-650	27-820	30-420	31-720	35-620	99-385	126-490	126-490
38-108	5-786	27	0	5-930	37-530	27-675	28-890	31-590	32-940	36-990	103-208	131-855	131-855
38-800	5-893	27	6	6-040	38-225	28-188	29-425	32-175	33-560	37-675	105-119	133-788	133-788
40-186	6-000	28	0	6-160	38-920	28-700	29-960	32-760	34-160	38-360	107-080	136-220	136-220
41-592	6-214	29	0	6-370	40-310	29-725	31-030	33-980	35-360	39-780	110-852	141-085	141-085
42-958	6-429	30	0	6-589	41-700	30-750	32-100	35-100	36-268	40-100	114-675	145-950	145-950
43-968	6-643	31	0	6-809	43-090	31-775	33-170	36-270	37-820	42-470	118-498	150-815	150-815
44-848	6-857	32	0	7-029	44-480	32-800	34-240	37-440	38-940	43-840	122-320	155-680	155-680
45-086	6-964	32	6	7-138	45-175	33-812	34-775	38-025	39-650	44-525	124-231	158-112	158-112
45-729	7-071	33	0	7-248	45-870	33-825	35-310	38-610	40-260	45-210	126-142	160-545	160-545
47-115	7-286	34	0	7-468	47-260	34-850	36-380	39-780	41-480	46-580	129-965	166-410	166-410
48-500	7-500	35	0	7-688	48-650	36-875	37-450	40-950	42-700	47-950	133-788	170-275	170-275
49-886	7-714	36	0	7-907	50-040	36-900	38-520	42-120	43-920	49-820	137-610	175-140	175-140
51-272	7-929	37	0	8-127	51-430	37-925	39-590	43-290	45-140	50-690	141-432	180-005	180-005
51-964	8-086	37	6	8-287	52-125	38-438	40-125	43-875	45-760	51-875	143-344	182-498	182-498
52-658	8-143	38	0	8-346	52-820	38-950	40-660	44-460	46-860	52-060	145-255	184-870	184-870

and 97 imperial quarters equal 15 tons tallow, Baltic Rates.

the same Freight as Wheat. Rye and Dari 2½% more; Linseed and Rapeseed 7% more than Wheat. Coarse Wool 2½ times tallow; Fine 3½ times Tallow.
20 cwt. = 1 ton.

N.B.—An Imperial Quarter Wheat is taken to average 480 lbs.—											
1	2	3	4	5	6	7	8	9	10	11	12
54-048	8-357	39 0	8-566	54 210	89-975	41-780	45-680	8-148	47-680	58-480	149-078
55-429	8-571	40 0	8-786	55-600	41-000	42-800	46-800	8-857	48-800	59-800	152-900
56-815	8-786	41 0	9-005	56-980	42-025	43-870	47-970	8-566	50-030	60-170	156-722
58-201	9-000	42 0	9-225	58-380	42-050	44-940	49-140	8-775	51-340	61-540	160-540
58-594	9-107	42 6	9-355	59-075	43-562	45-475	49-725	8-879	51-860	62-225	162-465
59-586	9-429	43 0	9-445	59-770	44-075	46-010	50-310	8-984	52-460	63-910	164-368
60-572	9-429	44 0	9-664	61-160	45-100	47-080	51-480	9-193	53-680	65-280	168-190
62-358	9-613	45 0	9-884	62-550	46-125	48-150	52-650	9-402	54-909	67-012	172-012
63-744	9-857	46 0	10-104	63-940	47-150	49-220	53-820	9-611	56-120	68-220	175-820
65-129	10-071	47 0	10-323	65-330	48-175	50-290	54-980	9-820	57-340	69-575	179-658
66-522	10-179	47 6	10-483	66-025	48-088	50-825	55-575	9-924	57-860	70-075	181-569
68-515	10-286	48 0	10-543	66-720	49-200	51-360	56-160	10-029	58-360	71-180	183-480
67-901	10-500	49 0	10-768	68-110	50-225	52-480	57-330	10-237	59-780	72-260	187-302
69-286	10-714	50 0	10-982	69-500	51-250	53-500	58-500	10-446	61-000	73-350	191-135
70-673	10-929	51 0	11-202	70-890	52-275	54-570	59-670	10-655	62-220	74-440	194-947
72-058	11-143	52 0	11-421	72-280	53-300	55-640	60-840	10-864	63-440	75-540	198-770
73-444	11-25	52 6	11-531	72-975	53-812	56-175	61-425	10-969	64-030	76-130	202-598
74-829	11-357	53 0	11-641	73-670	54-325	56-710	62-010	11-073	64-640	77-230	206-415
76-215	11-571	54 0	11-860	75-060	55-350	57-780	63-180	11-282	65-880	78-380	210-238
77-601	11-786	55 0	12-080	76-450	56-375	58-850	64-350	11-491	67-100	79-400	214-060
78-986	12-214	56 0	12-300	77-840	57-400	59-920	65-320	11-700	68-320	80-620	217-882
79-679	12-321	57 0	12-620	79-230	58-425	60-980	66-690	11-909	69-540	81-840	221-704
80-972	12-429	57 6	12-629	79-925	58-938	61-525	67-275	12-013	70-150	82-900	225-526
81-758	12-643	58 0	12-780	80-620	59-450	62-060	67-860	12-118	70-760	83-830	229-350
83-144	12-857	59 0	12-958	82-010	60-475	63-130	69-030	12-336	71-980	84-940	233-172
84-529	13-071	60 0	13-179	83-400	61-500	64-200	70-620	12-545	73-240	86-040	236-995
85-915	13-286	61 0	13-398	84-790	62-525	65-270	71-870	12-715	74-420	87-140	240-818
86-608	13-393	62 0	13-618	86-180	63-550	66-310	72-540	12-958	75-640	88-310	244-642
87-901	13-500	63 0	13-728	86-875	64-062	66-875	73-125	13-058	76-250	89-480	248-466
88-687	13-714	64 0	13-837	87-570	64-575	67-410	73-710	13-371	76-860	90-650	252-285
89-072	13-929	65 0	14-057	88-960	65-088	68-180	74-880	13-580	77-470	91-820	256-107
91-458	14-143	66 0	14-196	91-740	66-650	70-620	77-220	13-789	78-080	92-990	260-030
92-844	14-357	67 0	14-718	93-130	68-675	71-690	78-390	13-998	79-280	94-160	263-852
95-537	14-464	67 6	14-856	95-825	69-188	72-225	78-975	14-103	80-470	95-350	267-675
94-229	14-571	68 0	14-986	94-520	69-700	72-760	79-560	14-207	81-660	96-540	271-499
95-615	14-785	69 0	15-154	95-910	70-790	73-880	80-730	14-416	82-850	97-730	275-322
97-001	15-000	70 0	15-375	97-300	71-750	74-900	81-900	14-625	84-040	98-900	279-145

By the Baltic Printed Rate, in order to earn the same freight as with 100 quarters of wheat, a vessel was obliged to carry 111'11 of linseed, 117'65 of barley, 129'03 of oats. The Committee being of opinion that vessels of an average build cannot carry linseed and barley, 10 and 15 ¢ cent. respectively more than wheat, have based the calculations below on an excess of 6 ¢ cent. for linseed, and 12 ¢ cent. for barley :—

CALCULATIONS.					BY THE BAL TIC RATES.		SHOWING A CHANGE.		
Quantities assumed to be equivalent in storage to 100 imperial quarters of wheat.	At an average weight – imp. qr.	Are equal to units of 480 lbs.	To earn the same freight at 10s. – qr. the exact additional rate should be	Addi- tional – cent. adopted.	Giving a money result of	Equal – imperial qrs. in	At the same price equal to 6s. 8d. Tallow.	The same quantities would pro- duce a money re- sult of	Of – cent. for or against the ship.
WHEAT..... (the standard)	qrs. 100	lbs. 410	units. 100'40	10s.	– s. d. 50 0 0	s. d. 10 0	s. d. 10 0	– s. d. 50 0 0	+ 5'014
LINSEED	106'66	424	94'23	" & 6'12	7	50 8 3	9 5 41'100	9 0 48 0 0	+ 3'415
BARLEY	114'12	360	85'59	" & 16'84	17	50 1 5	8 11 64'100	8 6 48 10 0	+ 0'200
OATS.....	129'03	272	73'12	" & 36'76	37	50 1 11	7 9 8'100	7 9 50 0 0	+ 0'300
TALLOW	15'464	2240	72'16	" & 38'58	39	50 3 0		64 8 50 0 0	— 8'327
WOOL— Donskoi	5'623	"	26'24	" & 281'10	282	50 0 0		194 0 54 10 0	+ 16'686
Merinos	4'418	"	20'60	" & 385'44	386	50 0 0		194 0 42 17 0	

COMPARATIVE WEIGHTS.

HAMBRO' AND DUTCH SACK.						DUTCH SACK & IMPERIAL BUSH.			
Dutch sack.	Imp. bush.	Dutch sack.	Imp. bush.	Dutch sack.	Imp. bush.	Dutch sack.	Hambro' sack.	Dutch sack.	Hambro' sack.
lbs.		lbs.		lbs.		lbs.	lbs. oz.	lbs.	lbs. oz.
60	28	85	40½	110	52½	96	132 15	118	163 6
61	28½	86	40½	111	53	97	134 5	119	164 12½
62	29½	87	41½	112	53½	98	135 11	120	166 2½
63	29½	88	41½	113	53½	99	137 1	121	167 8½
64	29½	89	42½	114	54½				
65	30½	90	42½	115	54½	100	138 7½	122	168 15
66	30½	91	43½	116	55½	101	139 13½	123	170 5
67	31½	92	43½	117	55½	102	141 3½	124	171 11
68	31½	93	44	118	56½	103	142 10	125	173 1
69	32½	94	44½	119	56½	104	144 0		
70	33	95	45½	120	57½			126	174 7½
71	33½	96	45½	121	57½	105	145 6	127	165 13½
72	33½	97	46½	122	58½	106	146 12½	128	177 5½
73	34½	98	46½	123	58½	107	148 2½	129	178 5
74	34½	99	47½	124	59½	108	149 8½		
75	35½	100	47½	125	59½	109	150 5	130	180 0
76	35½	101	47½	126	60½			131	181 6
77	36½	102	48½	127	60½	110	152 5	132	182 12½
78	36½	103	48½	128	60½	111	153 11	133	184 2½
79	37½	104	49½	129	61	112	154 1		
80	37½	105	50	130	62½	113	156 7½	134	185 8½
81	38½	106	50½	131	62½	114	157 13½	135	186 15
82	38½	107	51	132	63½	115	159 3½	136	188 5
83	39½	108	51½	133	63½	116	160 10	137	189 11
84	39½	109	51½	134	63½	117	162 0	138	191 1

PROPORTIONATE WEIGHT OF GRAIN.

B. Bush. ; Qr. 8 bush. ; St. Stone or 14 lbs.

B. lbs.	QR. St. lbs.	B. lbs.	QR. St. lbs.	B. lbs.	QR. St. lbs.
35	90 0	46½	26 8	58	33 2
35½	90 4	47	26 12	58½	33 6
36	90 8	47½	27 2	59	33 10
36½	90 12	48	27 6	59½	34 0
37	91 2	48½	27 10	60	34 4
37½	91 6	49	28 0	60½	34 8
38	91 10	49½	28 4	61	34 12
38½	92 0	50	28 8	61½	35 2
39	92 4	50½	28 12	62	35 6
39½	92 8	51	29 2	62½	35 10
40	92 12	51½	29 6	63	36 0
40½	93 2	52	29 10	63½	36 4
41	93 6	52½	30 0	64	36 8
41½	93 10	53	30 4	64½	36 12
42	94 0	53½	30 8	65	37 2
42½	94 4	54	30 12	65½	37 6
43	94 8	54½	31 2	66	37 10
43½	94 12	55	31 6	66½	38 0
44	95 2	55½	31 10	67	38 4
44½	95 6	56	32 0	67½	38 8
45	95 10	56½	32 4	68	38 12
45½	96 0	57	32 8	68½	39 2
46	96 4	57½	32 12	69	39 6

RELATIVE RATES OF FREIGHT.

The Ton 20 cwt. ; the Quarter 480 lbs.

TON. s. s. d.	TON. s. s. d.	TON. s. s. d.
5 1 0½	23 4 11½	41 8 9½
6 1 3½	24 5 1½	42 9 0
7 1 6	25 5 4½	43 9 2½
8 1 8½	26 5 6½	44 9 5½
9 1 11½	27 5 9½	45 9 7½
10 2 1½	28 6 0	46 9 10½
11 2 4½	29 6 2½	47 10 0½
12 2 6½	30 6 5½	48 10 3½
13 2 9½	31 6 7½	49 10 6
14 3 0	32 6 10½	50 10 8½
15 3 2½	33 7 0½	51 10 11½
16 3 5½	34 7 3½	52 11 1½
17 3 7½	35 7 6	53 11 4½
18 3 10½	36 7 8½	54 11 6½
19 4 0½	37 7 11½	55 11 9½
20 4 3½	38 8 1½	56 12 0
21 4 6	39 8 4½	57 12 2½
22 4 8½	40 8 6½	58 12 5½

From Purcell.

ANGIER BROTHERS'

COMPARATIVE TABLE OF CLASSIFICATION OF SHIPS IN THE DIFFERENT REGISTERS IN VOGUE.

MARCH.]

[1870.

	I CLASS.		II CLASS.		III CLASS.	
	1st Degree	2nd Degree	1st Degree	2nd Degree	1st Degree	2nd Degree
Lloyd's Register	A. I.	A. I. (Red)	\mathcal{A} I.		E.	F.
Bureau Veritas	3/3. I. I.	5/6. I. I.	5/6. 2. I.	3/4. 2. I.	2/3. 2. I.	
Austrian Lloyds	A. I. I.	B. I. I.	B. II. I.	C. II. I.	D. II. II.	
Italian Register	100. I. I.	85. I. I.	85. II. I.	75. II. I.	65. III. II.	
Norwegian Register	A. I.	A. 2 ^a	A. 2.	B. I.	C. I.	
Bordeaux Register	1 ^a C. 1 ^o	1 ^a C. 2 ^o	2 ^a C. 1 ^o	2 ^a C. 2 ^o	3 ^a C. I.	
German Lloyds	A. I.	A. II.	B.		C. I.	
American Lloyds	A. I. A. I—	A. I $\frac{1}{2}$.	A. 1 $\frac{1}{2}$ —	A. 2.	A. 2—	
Dutch Register.....	A. I.	A. 2.	B. I.	B.	C.	D.
						Lloyd's Register. Bureau Veritas. Austrian Lloyds. Italian Register. Norwegian Register. Bordeaux Register. German Lloyds. American Lloyds. Dutch Register.

IRON SHIPS AND STEAMERS 1st CLASS ONLY.

Lloyd's Register	\mathcal{A} I.	\mathcal{A} I.	\mathcal{A} I.	Lloyd's Register.
Lloyd's Register	A. 100.	A. 90.	A. 80.	Lloyd's Register.
Liverpool Registry	(Red) 20 Years 1	(Red) 19 Years 1	(Red) 18 Years 1	
	Subject to Survey every Four Years.	Subject to Survey every Three Years.	Subject to Survey every Two Years.	

SWINEMUNDE—GOODS PROPORTIONED IN STOWAGE.

(A keel 850 cubic feet.)

97	Quarters wheat.	17	Tons tallow.
88	Quarters tares, beans, and peas.	17	Load square timber.
105	Quarters rye.	14'923	Load round timber.
108	Quarters seed	About	5'7 standard deals.
114	Quarters barley.	10	Tons clean.
125	Quarters oats.	9'107	Tons outshot.
20	Tons oilcake.	7'760	Tons half-clean.
16	Tons best bones.	5'825	Tons codilla hemp and flax.

In **Belgium** the proportion of 29 hectolitres to 10 quarters is officially recognised; masters complain that this is much against the ship. The remedy is to fix the French measures when chartering.

RUSSIA.

1	Tschetwert wheat weighing 10 poods	=0'72 quarters.
1	„ rye „ „	=0'80 „
1	„ linseed „ „	=0'83 „
1	„ rapeseed „ „	=0'83 „
1	„ barley „ „	=0'88 „
1	„ oats „ „	=1'23 „

TAGANROG.

The conventional weight and measures in usage in this place are as follows :—

100	Chetwert hard wheat equal to	.....	70 quarters.
100	„ soft wheat	.....	72 „
100	„ rye	.....	77 „
100	„ barley	.....	88 „
100	„ oats	.....	73 „
100	„ linseed	.....	83 „
100	„ rapeseed	.....	78 „

1 pood=36 lbs. ; 63 poods=1 ton ; 37 vedros=100 gallons.

ODESSA	.....	72 quarters English=100 tschetverts ; 1 pood=36 lbs. English ; 1 vedro=10 quarters English.
SALONICA	.....	1 kilo grain=4 bushels=3'78 kilos of Smyrna.
PANORMA	.....	1 kilo grain=1 Winchester bushel.
JEDDAH	.....	100 ardebs=63 English quarters ; 54 kilos=1 ardeb.
SPAIN	.....	At Setubal 1 moie is equal to about two-thirds of a ton.

447. **GRAVITY (SPECIFIC).** From the following table of specific gravities, the weights of bodies may be calculated from cubical measurement. By specific gravity is meant the weight of bodies compared with similar bulks of water. Thus, a cubic foot of water weighs 1,000 ounces : by reference to the table, turpentine will be found 872, meaning that a cubic foot will weigh 872 ounces ;

iron 7,780, meaning that a cubic foot will weigh 7,780 ounces. By taking the cubical measurement of any body the weight may be ascertained by multiplying into its weight in water the number found against its name in the following table. Thus, suppose we have a 100 bars of iron, each one inch square and 10 feet long, the cubical contents are found by multiplying 10 feet long by 1·144ths of a square foot, or ·00694, the product being ·0694 of a cubical foot. As a cubic foot of water weighs 1,000 ounces, the weight of a bulk of water equal to the bulk of the bar will be $\cdot 06,944 \times 1,000 = 6\cdot949 \times 100 \text{ bars} = 6,946 \text{ ounces}$ or $434 \text{ lbs.} \times 7\cdot78$, the figures opposite in the table. The product is 3,376 lbs.

Acid, acetic	1'062	Glass, crown	2'520
„ muriatic	1'200	„ green	2'642
„ nitric	1'271	„ flint	2'760 to 3'000
Arsenic, sulphuric	1'840	„ common plate	2'760
„ white	3'700	Granite	2'613 to 2'956
Alabaster	1'870	Gum arabic	1'452
Alcohol, absolute.....	0'797	Gunpowder, loose	0'836
Alum	1'714	„ solid.....	1'745
Ambergis	0'780 to 0'926	Gutta percha	0'925
Anthracite	1'800	Gypsum, compact or } plaster of Paris... }	1'872 to 2'288
Antimony, regulus	6'720	Honey	1'450
„ sulphuret	4'500	Indigo	1'009
Barytes, sulphate of, } or heavy spar ... }	4'000 to 4'538	Ironstone, Carron	3'281
Bazalt	3'000	Isinglass	1'111
Borax	1'714	Ivory	1'825
Brick	2'000	Lard	0'947
Butter	0'942	Lead ore, Derbyshire	6'565 to 7'786
Caoutchouc or Indiarubber ...	0'933	Limestone, compact....	2'386 to 3'000
Chalk	2'252 to 2'675	Magnesia, native, hydrate of ...	2'330
Coal	1'020 to 1'970	Malachite, compact... 3'572 to	3'994
Coke	0'744	Marble, Carara	2'716
Copal	1'045	Mastic (a resin)	1'074
Copper ore, yellow	4'160	Metals, arsenic	5'763
„ red	5'8 to 6'000	„ brass	7'824 to 8'396
Cider	1'018	„ cobalt	8'600
Cork	0'240	„ copper	8'900
Emery	4'000	„ gold, cast	19'258
Ether, acetic 0'866 muriatic	0'729	„ iron wrought	7'780
Fat of beef	0'923	„ „ cast	7'248
Felspar	2'438 to 2'700	„ „ pyrites or mundic	4'700
Flint, black	2'582	„ iron ores, hematite ...	3'920

Metals, iron clay	3'12 to	3'380
„ lead	11'250	
„ lead, galena	7'600	
„ lead, carbonate, or dry white lead ...)	6'500	
„ lead, oxide lith. 9'2 to	9'500	
„ red lead	8'62 to	9'000
„ manganese, black oxide	4'310	
„ mercury	13'598	
„ nickel	8'279	
„ platina	19'500	
„ silver	10'474	
„ steel, soft	7'833	
„ tin	7'290	
„ zinc, Cornish	7'291	
„ zinc ore	6'700	
„ zinc	6'200 to	7'191
„ zinc ore, black jack ...	4'000	
„ zinc calamine	3'600	
Mica	2,650 to	2'934
Mineral pitch or as- phaltum	0'905 to	1.233
Naptha	0'700 to	0'847
Nitre		1'900
Oils, aniseed		0'986
„ caraway seed		0'904
„ lavender		0'894
„ turpentine		0'870
„ hempseed		0'926
„ linseed		0'940
„ rapeseed		0'913
„ whale		0'923
Opal, common	1'987 to	2'114
Opium		1'336
Phosphorus		1'770
Pitch		1'150
Plumbago	1'987 to	2'400
Porcelain, China		2'384
Porphyry	2'458 to	2'972
Proof, spirit		0'932
Pumice stone	0'720 to	0'914
Quartz	2'624 to	3'750
Rock, crystal	2'581 to	2'888
Salt, common		2'130
Scammony, Smyrna		1'274
Slate, drawing		2'110

Slate, common roofing	2'762
Spar, fluor	3'094 to 3'791
Spermaceti	0'943
Stalactite	2'323 to 2'546
Stone, Bristol	2'510 to 2'640
„ grinding	2'142
„ Portland	2'496
„ rotten	1'981
Sugar	1'606
Sulphate of soda or salt cake...	2'200
Sulphur, native	2'033
Talc	2'080 to 3'000
Tallow	0'941
Turpentine	0'872
Vinegar	1'013 to 1'080
Water, distilled	1'000
„ sea	1'028
„ Seltzer	1'003
Wax, bees'	0'964
Wine, Bordeaux	0'993
„ Burgundy	0'991
„ Constance	1'081
„ Malaga	1'032
„ Port	0'997
„ Champagne, white	0'997
Wood, apple trees	0'793
„ ash	0'845
„ beech	0'852
„ box, French	0'912
„ box, Dutch	1'328
„ red, Brazil	1'031
„ campeachy	0'913
„ cedar, wild	0'596
„ cedar, Palestine	0'613
„ cherry trees	0'715
„ citron	0'726
„ cocoa	1'040
„ cork	0'240
„ cypress, Spanish	0'644
„ ebony, American	1'331
„ ebony, Indian	1'209
„ elder tree	0'695
„ elm ditto	0'671
„ fir, male	0'550
„ fir, female	0'498
„ hazel	0'600
„ juniper	0'556

Wood, lignum vitæ	1'333	Wood, plum	0'785
„ mahogany	1'063	„ pomegranate	1'351
„ maple tree	0'750	„ poplar	0'383
„ mulberry, Spanish	0'897	„ poplar, white Spanish...	0'529
„ oak, heart, 60 years old	1'170	„ vine	1'327
„ oak, dry	0'930	„ walnut	0'681
„ olive tree	0'927	„ Willow	0'581
„ orange	0'705	„ yew, Dutch	0'788
„ pear	0'166	„ yew, Spanish	0'807

UNITED STATES WEIGHT OF A CUBIC INCH.

Lead, equal	4103 lbs.	Iron, cast	263 lbs.
Copper, sheet	3225	Tin, ditto	2636
Brass, ditto	3037	Zinc, ditto	26
Iron	279	Water	03617

448. GROATS, or Grits are oats freed from their husks. Eight sacks of Irish groats go to a ton.

449. GROUND NUTS, shelled. Bombay ton 16 cwt.

450. GUANO. The original name of guano is huanu, which is a term in the Quichua dialect, meaning "animal dung;" for example huanacuhuanu, excrement of the huanu. As the word is now generally used, it is an abbreviation of pishu huanu, bird-dung. The Spaniards have converted the final syllable nu into no, as they do in all words adopted from the Quichua which have the like termination. The European orthography, guano, which is also followed in Spanish America, is quite erroneous; for the Quichua language wants the letter g, as it does several other consonants. Spaniards pronounce the word as if written wauno; the gu and hu in Spanish being equivalent to one w. The guano districts of Bolivia are under Forysyth Island, Constitution Roads; also in Mexilones Bay; and Paquiqui; the guano districts of Peru for foreign vessels are the Chincha Islands.

451. The best guano is the excrement of sea-fowl and seals, allowed to accumulate in countries where there is no rain; it sometimes includes the bodies of seals, which seek the highest points of land on feeling the approach of death. It owes its virtue as a manure, first to the presence of ammoniacal salts, and secondly to that of the phosphate of lime or bone earth, derived from the bones of fish, &c.

452. To test the ammonia, put a spoonful of guano and a spoonful of powdered quick lime in a mortar, and rub them with a pestle for a few seconds; if the guano be genuine the smell will

resemble that of a bottle of salts, and will make the eyes water in the same manner. In this way it may be proved whether the sample be guano or not, and the strength of different samples may be estimated by the comparative strength of effluvia of the ammonia disengaged. To test for the phosphate of lime, place a small quantity (say 100 grains) in an iron ladle or earthenware pipkin, or any similar vessel, and heat it red hot over a clear fire for twenty minutes; if the guano be genuine it will be reduced to a white ash, weighing about 35 grains; if the 100 grains, when burned, weigh much more than 35 grains, it is not genuine, or contains an undue proportion of sand or similar matter.

453. The ashes from genuine guano will be found to be phosphate of lime, nearly pure. If it be required to prove this, a small bottle of acetic acid or white vinegar will dissolve the phosphate and hold it in solution, leaving the silica and alumina (probably amounting to three or four grains) undissolved. The ashes should be left in the acetic acid for two days, and the bottle shaken occasionally. It is assumed that the guano to be tested is dry.

454. Professor NESBITT says "good Peruvian guano ought to contain 16 or 17 $\frac{1}{2}$ cent. of ammonia, and from 25 to 30 $\frac{1}{2}$ cent. of the phosphate of lime." He made an experiment as follows:—A stoppered bottle, capable of holding 3,000 grains of water, had four ounces avoirdupois of good guano placed in it. Water was then added, and the materials shaken until well mixed. A little more water was added, and the bottle again agitated, and then allowed to rest for three or four minutes to permit the air bubbles to arise. The bottle was now completely filled with water, the froth running over; the stopper was then gently, but accurately, fitted to its place, and the bottle wiped with a cloth. A counterpoise previously made equal to the weight of the bottle alone, was then placed in one pan of a small pair of ordinary scales, and the bottle, with the guano, in the other. From a numerous series of experiments, it was found that the bottle and the guano, on an average, weighed 664 grains more than the bottle and water alone: that is, the water in the bottle would weigh 3,000 grains, and the guano and water 3,664 grains.

COMPOSITION OF GOOD PERUVIAN GUANO.

Water	17'400
Organic matter, and ammoniacal salts*	49'970
Phosphates of lime and magnesia (bone earth)	23'660
Alkaline salts, chiefly chlorides of potassium and sodium	7'430
Sand	1'540

*Yielding Ammonia.....18'96

100'000

T

455. Guano weighs from 50 to 70 lbs. Φ bushel, and will absorb 20 Φ cent. additional of water, which it will attract in a most extraordinary manner, for when well dunnaged off in a dry ship, all that part near the sides becomes dark, by moisture drawn through. When moist, it has a tendency to undergo decomposition, with the production of inflammable gases, which form, with the air, a mixture liable to explosion on exposure to naked flame. Every precaution is necessary to keep the pump-well perfectly clear; iron knees and hoops around masts should be painted or tarred, as they are liable to corrosion by the action of guano. The decks and top sides require to be well caulked, and seams paid; one master recommends a coat of Archangel tar just before leaving, and again when passing through the tropics. A ship will ordinarily carry as much guano as coal; and if she sails well on even keel, may be loaded "chock up," if otherwise, space must be allowed for trimming.

456. Guano cargoes injure the iron-work of the hold, but some experienced masters do not consider they injure the wood-work. The Boston (United States) *Commercial Bulletin* says "during the past year (1860?) several first-class ships, between three and six years old, have required extensive repairs. Not only have their ceiling and planking been decayed, but many of their timbers also, particularly their cants; while the keelsons and first futtocks have generally been sound. A few planked with yellow pine, which in some instances was not affected, though the timbers were decayed; and in others the rot penetrated both pine and oak. As nearly all these ships were built under inspection, they were considered good for ten years at least. As all had carried guano shortly after they were built, it has been assumed that guano affects new timbers injuriously. One or two which have not carried it it until three years old were not so much injured as those on their first voyage; and others which were eight or ten years old were not affected at all. The washing of the salt-water in the bottom is supposed to have preserved the first futtocks and the keelsons; and those ships which leaked in their upper works were also free from rot in the wake of their leaks. As nearly all our vessels are built of *unseasoned* timber, it is supposed that the leak generated by the moisture of the timber, combined with the heat of the guano, had produced dry rot. Mr. M'KAY states that new English ships which had carried guano, were as badly decayed as any of our own; he stated further that in England there was no doubt concerning the injurious effects of loading new ships with guano;" see the article salting.

457. "Grain in bulk was also considered very liable to affect a

new ship with dry rot, on account of its tendency to engender heat. It seems that even yellow pine, which is generally considered not liable to decay on account of its resinous quality, is not proof against the effects of grain. If these inferences are correct, owners of new ships must be on their guard against loading them with guano or grain; or they must devise some means by which their frames can be moistened with salt-water. If the ceiling is caulked, water might be injected through the ventilators in the covering boards at stated periods, since it is evident that water in the bottom preserves it. Some ventilators are water-tight, but these could be easily changed for others; indeed there is little difficulty in the way of making openings between all the frames. Pour water through these by way of experiment; the work may appear tedious, but not more so than half the labour performed on board all our ships. Our sperm whalers, which are more exposed to heat than any other class excepting steamers, are, we believe, preserved from decay, by the regular practice of wetting their holds after they have oil on board. Twice or thrice a week a hose is passed into their holds for the purpose of watering the oil casks to prevent their leaking, and to this cause we attribute their durability. Whalers are rarely affected by dry rot, though exposed not only to the heat of the tropics but to the fires of their try works. This system of watering is not adapted to a merchant ship with a cargo; but the plan which we suggest of injecting water between the frames might be carried out with good effect. At all events, it is entitled to consideration. Probably some would object to this on account of the effect of salt-water upon the iron fastenings; but as nearly all our ships are iron-fastened in the bottom as well as in the upper works, the effect would not be more injurious in the one place than in the other."

458. At the **Chinchas** guano measures about 40 feet per ton; usually 15 bags go to a ton, but they are various, the lesser about 12 inches by 18, made of fine cloth, the larger two feet square, of a material so coarse that it is very possible for the finer parts of the guano to pass through while stowing. Mats might be found useful, nailed from below to the upper deck, overlapping over all.

459. The form of **charter-party** adopted by Messrs. I. THOMSON, T. BONAR & Co., the English Agents of the Peruvian Guano Consignment Company, was as follows:—

LONDON,

18

It is hereby mutually agreed between Owners of the tons register new measurement, on the one part, and Messrs. I. THOMSON, T. BONAR & Co., of London, for and as Agents of the Guano Consignment Company

of Great Britain (the charterers), for the Supreme Government of Peru, on the other part as follows :—

That the said vessel now shall sail direct, after discharging outward cargo, to Callao, where the captain shall immediately place the ship at the disposal of the said Guano Consignment Company advising them in writing.

That the said vessel on inspection by the appointed officer, being then approved as tight, staunch, strong, and well-conditioned for the voyage, the charterers shall (within forty-eight hours after such report being received) send to the captain or his agents, orders for loading a cargo of guano at the Chincha Islands, to which place the vessel shall at once proceed, calling on her way at Pisco, to obtain the necessary pass to load, which shall be given to the captain by the charterers' agents, free of expense, within twenty-four hours of his application.

After completing her loading of guano, and having obtained the necessary pass from Pisco, the vessel shall return for her final clearance to Callao, where the captain shall have the liberty of taking in passengers, light goods, and specie, on freight for the benefit of the ship. The charterers to have the option of shipping the light goods at current rates.

The ship when laden, shall not go through the Boqueron Passage, between the Island of San Lorenzo and the Main Land.

The ship shall convey from Callao to the Islands, any specie that may be required for the payment of the cargo, and any tools (sent alongside by the charterers whilst the vessel is at anchor in Callao), free of freight : and shall supply, free of charge, either on board or alongside, at the Guano Ports, any water that may be required by the charterers, not exceeding one per cent. of the register tonnage.

At the Chincha Islands the vessel to be placed under the Mangueras to load, or at the option of the charterers' agent there, the cargo to be placed in the ship's boats, and in them conveyed on board at the ship's expense and shipper's risk.

Such sacks as shall be supplied by the charterers at their discretion, shall be filled with guano, and the mouth of the sack sewn up at owner's expense, the charterers providing twine, and the sacks shall be used for lining the vessel.

The owners to find necessary dunnage, and to be responsible for damage by negligence.

The owners to be liable for all damage arising from side lights or ports.

The guano shall be stowed so that a clear space may be left around the vessel, under the deck, for the purpose of examining the cargo, and removing any water which may have been shipped ; and every convenient opportunity shall be taken to examine the guano, and means used to prevent and lessen damage.

The quantity of guano to be shipped shall not exceed one-third above the vessel's register tonnage, new measurement, except with the consent in writing of the charterers' agent at Callao, and which consent the charterers undertake shall be given to all ships which their agents have not fair and reasonable grounds for believing to be overloaded, when such consent may be withheld, and if any vessel proceed to sea without such written consent, and loss should be sustained by the charterers upon the guano, and whether the same be of a nature of a particular or general average, or of charges upon the guano, all such loss as between the said owners and charterers shall be deemed to have arisen from the improper loading of the vessel, and the amount of such loss shall be borne and paid by the said owners to the said charterers ; but in the case of loss in the nature of particular average, the owners shall only pay to the charterers such amount as may

exceed £3 per cent. upon the net value of the limited cargo of guano hereby agreed to be shipped.

No guano or other dead-weight shall be received on board except by order of the charterers or their agents.

Should political or other circumstances prevent there being sufficient labourers at the loading-place, as many of the crew as shall not be absolutely necessary for the safety of the ship, shall be sent on shore to load the cargo, they receiving the usual labourer's daily pay while so employed.

Ten running days (Sundays excepted) for each one hundred tons, new register measurement, to be allowed the charterers for loading the ship at the Islands, nevertheless in no case shall the charters have less than thirty, nor more than eighty such days in all. Said days to commence from the day the master gives notice, in writing, of being ready to receive and take on board, and to cease when the charterers' agents give notice that the vessel may leave the Islands.

Thirty days to be allowed the owners for taking in light freight and specie as above specified.

Over and above the lay-days allowed the charterers for loading the ship, and to the owners for taking in light freight and specie, each party shall be permitted to detain the vessel for those purposes respectively, for thirty days, the charterers paying to the owners, or the owners paying to the charterers, as the case may be, at the rate of £1 for every 100 register tons per day, as agreed compensation for such detention, payable in Lima at the exchange of 48*d.* per dollar currency.

Should the vessel be unnecessarily detained at any other period of the voyage, such detention to be paid for by the party delinquent to the party observant, at the above-named rate of demurrage or compensation.

The owners of the vessel to pay all port charges, and the ship to be consigned to the charterers (the Guano Consignment Company to Great Britain), in Lima, to whom the customary commissions and agencies for doing the ship's business shall be paid by the owners.

The captain to sign bills of lading at such rate of freight as charterers may direct, and without prejudice to this charter-party.

The said vessel shall, after completing her loading as before-mentioned proceed as ordered by bills of lading to CORK or CROOKHAVEN, (and where she is to remain until the return of post from London) for orders from the Guano Consignment Company to Great Britain, or their agents, to proceed to a safe port in the UNITED KINGDOM, unless ordered by bills of lading to proceed direct to any port and there according to bills of lading and charter-party, deliver the cargo, which is to be discharged and taken from alongside, at the rate of not less than thirty-five tons per working day.

Should the charterers or their agents require that the discharge of the guano be made in sacks, they shall furnish the captain with the required number, and with threads sew them at their expense, and the owners of the ship will cause them to be filled and sewn up and delivered overside at ship's expense.

The freight under this charter-party to be paid in manner hereinafter mentioned, is at the rate of sterling, in full, per ton of 20 cwt. net weight of guano, at the Queen's beam, subject however to a deduction for the water contained in damaged guano, and on the sweepings and stones they shall only pay half-freight.

The master to be supplied in Lima with a sum not exceeding £ free of interest and commission, but the cost of insurance to be borne by the owners, and the amount so advanced, and the cost of the insurance there of shall be in part payment of the freight at the exchange of 42 pence per dollar currency. And should the charterers or their agents think it necessary to advance the master beyond the said sum of £ any sum for repairs, stores, and other disbursements whatsoever, such sums, with interest, commission, and insurance, shall be in part payment of the freight, at the exchange aforesaid. And it is hereby expressly agreed, that the receipt of the master for any such sum or sums of money as shall be supplied or advanced to him by the charterers as aforesaid, shall be conclusive and binding upon the owners and their assigns, and they shall thereby be prevented as between them and the charterers from enquiry into the necessity for, or the appropriation of the sum of money which in such receipt or receipts shall be acknowledged to have been received: and all contributions to general average losses, which (if any) shall become payable in respect of any such advances as aforesaid, shall be borne and paid by the owners.

The freight to be paid (subject to the terms and conditions of this charter-party) in manner following, that is to say £1 per ton on the estimated cargo, in cash, on arrival at port of discharge, three month's interest at the rate of £5 cent. per annum being deducted, and the balance, after deducting all such sums of money as shall become payable to the charterers or their agents under the provisions herein contained, forty-eight hours after the true and right delivery of the whole of the cargo, in cash, less three months' interest at £5 per cent. per annum, or at the option of Messrs. I. THOMSON, T. BONAR & Co., by their acceptances at three months' date payable in London, and the captain or owners shall give, in exchange for said acceptances or cash, duplicate receipts in full of all demands whatsoever upon the cargo or otherwise.

And in the event of any rival claims to the said freight, the charterers shall be at liberty to retain the same in their hands until the right of the respective claimants is determined, or to pay into court deducting their costs.

The charterers are hereby authorized to retain and deduct from the freight all claims, damages, and sums of money, as well liquidated as unliquidated, to which the owners shall become liable to the charterers, by virtue of, or in anywise in relation to this charter-party, and all seamen's wages, pilotage, and port charges, if any, which they may be compelled to pay in order to prevent the delay in the delivery of the cargo, or to prevent the arrest thereof, it being the intention of the parties, that all claims and demands, of whatever nature, which shall accrue to the said charterers, shall be treated as payments made by the charterers on account of freight.

And if the vessel should be compelled to put into any port or ports along the Pacific or Atlantic coasts, the captain shall consign her to the Guano Consignment Company, or their correspondents; in either place paying the usual commission; such correspondents in ports of Chili being Messrs.

In VALPARAISO	Messrs. RUIZ BROTHERS.
In MONTE VIDEO	Messrs. BATES, STOKES, & Co.
In RIO DE JANEIRO.....	Messrs. EWBank, SCHMIDT, & Co.

Penalty for non-performance of this charter-party, the estimated amount of freight.

The act of God, the Queen's enemies, fire, and all and every dangers and accidents of the seas, rivers and navigation, of whatever nature and kind soever, during the said voyage, always excepted.

The ship to be consigned to the Company, or to their agents in Great Britain, to whom is to be paid an address commission of two and a half per cent. at the port of discharge, and who are to have the right to name the docks in which the ship is to be discharged, and the broker who is to report the ship at the custom-house, and do the ship's business.

A commission of two and a half per cent. is due by the ship on signing this charter, which shall be deducted from the freight on arrival, and if the ship do not arrive at her destination, said commission shall be paid in London by the owners.

For the Guano Consignment Co.

As Agents.

Witness to the signature of Messrs. I. THOMSON, T. BONAR & Co.

Witness to the signature of

460. **Dunnage** of from 15 to 20 inches is required ; some recommend 2 feet, to make the cargo more secure and the ship easier at sea. An experienced officer in the merchant service says, guano should be stowed on a platform similar to that used for copper ore or it should be well dunnaged, say as high as the keelson ; then bags say two tier fore and aft, so stowed as to prevent any air from being drawn through by the suction of pumps, or the powder or loose guano from finding its way between. The ship's sides should be well dunnaged, say not less than three inches ; and a tier of bags carried up to the lower beams ; the hold stowed so that a man can go on and around the cargo daily, to watch if any drainings are visible from the deck, and if so, the wet spots should be taken up immediately, as a small portion of water will dissolve a large quantity of guano. On no account should the crystallized part of the guano be stowed among the cargo, but separately in casks ; several fatal accidents are said to have occurred to vessels from Patagonia, through not taking this precaution. The cargo should not be interfered with after it is stowed, for the article will loose a portion of its quality every time air is admitted, as well as evaporate and decrease in bulk. It is very rare that a vessel will carry her hold full, and it is seldom that a ship will turn out what she takes in. The average term for loading is 70 to 80 days.

461. It is the practice for ships in the Peruvian trade to be first surveyed at Callao by the government officers who grant the loading licenses. If their decks and topsides require caulking, the operation is done very speedily by say ten men in two days. The ship then goes to the islands, which are only 13° 38" South of the line ; here she is inspected by LLOYD'S surveyor ; the loading may occupy from two to three months, during which time she is constantly exposed to

the heat of the sun, in a climate where rain is unknown. It would appear to be a better course to caulk the ship carefully as she goes down in the water, and to employ say two men during the last ten days, when attention could more easily be paid to the manner in which the work is done. Were this possible, the engagement of an extra carpenter, when signing articles, might be found advantageous; there is, however, usually a good supply at the Chinchas. Some recommend that every guano-laden ship should have a trunk or well, built with heavy plank, down the after hatchway, say half its size, through which the leakage could be got at if the pumps were choked.

462. A thin coating of gypsum or plaster of Paris, moistened with sulphuric acid, laid over the top of the cargo will, it is said, abate if not entirely prevent the annoyance and danger of injury to health; it can be removed again before discharging, and will readily sell for more than its cost. The same effect may be produced by sprinkling the surface of the cargo with diluted sulphuric acid, which will not injure the guano. Some merchants contend that there is no danger of injury to health.

463. After discharging a cargo of guano, the first duty is to remove the ballast, scrape and brush every part of the hold, cleanse the chain lockers, &c. A ship may be rendered perfectly sweet by putting a few pounds of chloride of lime with water into a bucket, adding sulphuric or muriatic acid. Place the bucket at the bottom of the hold, and at intervals add acid until a strong smell of chlorine issues from the hatchways. After a few hours the chlorine will be absorbed or pass off, and the cleansing may be completed by washing with water and whitewashing with fresh lime. As the keeping of sulphuric or muriatic acid on board ship is not unattended with danger, common alum, which is in a solid form, may be used advantageously as a substitute, dissolved in water, for sprinkling over the surface of the guano, or powdered, moistened, and mixed with chloride of lime, as a source of chlorine for purifying the ship.

464. Guano is injured by contact with salt, nitrate of soda, &c., and it injures almost every article of human consumption, on account of the large proportion of ammonia which it contains; it will turn nuts, leather, &c., almost black. Good coasting vessels may not require dunnage (see dunnage); but they must carefully avoid stowing general goods in the same hold, particularly delicate articles such as tea, coffee, chocolate, &c., and printed goods, lilacs especially, the colour of which will be extracted, even during a short passage, so powerful is the ammonia which escapes.

465. On the 31st October, 1857, the barque *Victor*, Captain HOLMES, left the *Chinchas* with 600 tons of guano, for England, and foundered at sea on the 7th April, after having rounded the Horn. She was built in the state of Main in the year 1843, 395 tons register, 650 burthen. Her floor was flat, and received some strong long heavy timber, laid separately fore and aft, crossed with short open dunnage framed to the long in the form of sleepers; this framework was covered with small wood close together. Depth 24 inches on the floor, 20 in the bilge—the small wood diminishing to nothing at mid-distance between the bilge and lower deck. The dunnage was covered with half-filled bags on the floor, carried overlapping up the sides, their contents gradually decreasing to nothing until they reached the skin against which they were battened; on them the guano was thrown in bulk—the ends of the ship being kept clear. Pieces of plank, about two feet long, were fitted round the 'tween decks, their heels 18 inches from the sides, against which they were inclined, so as to leave a clear passage for water. The lower hatchways were left open, and several lower deck planks removed, to let the cargo fall below, as it settled. When laden there was a space about four feet high in the 'tween decks next the sides, sufficiently capacious for a man to go round, and the fore peak and stern sheets were left perfectly clear. Through some cause unknown she leaked both fore and aft. The water was first slightly discoloured, it then became thick and the pumps were frequently choked; as it fell on the deck it threatened to "eat" through the seams had they not been protected. Subsequently the water forward and aft could not find a passage to the pump well, and was therefore, taken out with buckets made of canvas, which were soon destroyed by the powerful action of the guano. Those of the crew employed bailing suffered severely from its effects on the skin of their hands, and by the ammonia which escaped the more readily when the cargo was wetted and disturbed. To the officers it appeared that as the ship was tossed about, the water in the extremities surged against the guano, and after washing away the loose parts and excrescences, did not clear more than three or four inches every 48 hours, so that the ends of the cargo assumed, in a measure, the character of a sea wall.

466. One master who brought guano from the Pacific in a ship, the leakage of which had communicated fore and aft, by the wings, stated that every time she put about, the cargo seemed to drop heavily to leeward, as if its exterior had become thoroughly wet and hard, and that the whole had, by settlement, caked into one lump. His expression was "that the guano moved about like a lump of ice in a bucket of water."

467. The ship *Eldorado*, which was fitted especially for the guano trade, registers 1,000 tons, and carries 1,400 tons of guano, is 158 feet long, 35 feet broad, and has a depth of hold of 22 feet. She has a platform four feet from the ceiling, supported by a sister keelson each side the main keelson, and two bilge logs fore and aft. A boy can creep along between the platform and the ceiling. The *Eldorado* answers very well.

468. The American ship *Greenwood*, Capt. STONE, belonging to Kennebuck, State of Maine, 884 tons register American, and 930 English, took in at the Chincha Islands in June, 1862, 1,650 tons of guano. The dunnage on the floor, two feet deep, consisted of deals and scantling, floored with board, and from her bilge keelsons, six feet up and down, there was between the deals and the wings a space of 18 inches. Part of the cargo was packed in 1,330 gunny bags, 40 lbs. in each, about two-thirds full, so as to spread over a larger space on the flooring. When laden, the guano in the hold rose close up to the 'tween decks amidships and rounded off to a distance of from four feet at the sides. That in the 'tween decks was stowed in the same manner. On arrival in the Channel it had settled down three feet, so that a man could creep over every part of the cargo. The *Greenwood* is 163 feet long, 33 feet 6 inches broad, and has a depth of hold of 23 feet 7 inches; her height between decks is 7 feet 9 inches. With 1,650 tons guano she drew 22 feet aft and 21 feet forward. With 1,605 tons Cardiff coal, intake measurement, and 1,763 tons delivered in Rio Janeiro, she drew 22½ feet aft and 21½ feet forward.

469. The ship *Napier*, 1,424 tons register, Captain WILLIAM WHITE, belonging to Mr. S. R. GRAVES, of Liverpool, loaded guano at the **Chincha Islands** in 1864, left 26th July, and arrived at Plymouth 24th November. She was built at Boston, U.S., is 215 feet long, 41 feet 6 inches broad, and 27 feet 6 inches deep. Her three decks are respectively 14 feet, 7 feet, and 7 feet high. To receive the cargo a platform was erected 18 inches above the bilges, and was carried up the sides (casing fashion), say 8 feet above the level of the bilges. The ground tier consisted of 1,900 gunny bags containing about 1 cwt. each; remainder in bulk. With this cargo the *Napier* drew 23 feet 3 inches on an even keel; and on arrival 23 feet; part of the diminution was due to the consumption of fuel and provisions, and part to the exhalation of the cargo. Her hold was quite full, and taking the guano as a dead-weight cargo, she was at her proper draught, viz., 7 feet 11½ inches clear side. The *Napier's* foremast is 52 feet from the knightheads, and none of the cargo was

before it ; just abaft this mast, in each wing, a few casks were placed. The guano at the mizenmast was chock up to the deck, and thence it sloped down to the stern: Of the cargo (1,850 tons) 900 tons were computed to be placed in the lower hold, 650 on the second deck, and 200 on the third deck, leaving space say for 200 tons in the lower hold, 200 second deck, and 250 on the third deck. The cargo was thus almost in the centre of the ship, and she behaved very well at sea. The passage from Callao to Cape Horn was made in 22½ days, to the equator 53 days, and from Callao to Queenstown 88 days. She grossed in 1,864 tons 7 cwt. and netted out 1,850 tons 4 cwt.

470. The ship *Messenger*, of New York, 1,350 tons register, Capt. WALDOW HILL, loaded guano at North Chincha Isle in November, 1864. She is 200 feet 8 inches long, 21 feet 11 inches deep at the pumps, and has a height of 'tween decks of 7 feet 6 inches. The cargo was estimated at 1,300 tons ; two-thirds were in the lower hold, which was nearly full, say within 40 feet forward and 40 feet aft : one-third in the 'tween decks, round which a gangway was left in each wing. She drew 20 feet forward and 20 feet 8 inches aft, and was rather laboursome at sea ; with a difference of four inches only she would have been in better trim. A general New York cargo delivered at San Francisco made her 20 feet on an even keel, when she was less laboursome. The *Messenger* has a sharp bottom and little bilge, and the wood dunnage used under the guano, 15 inches deep, did not require to be very long, say 7 feet. Capt. HILL recommends for guano cargoes five-inch square stuff to be placed each side the keelson to receive the planks.

471. There is a guano obtained from the **Kooria Moorla Islands**, which is sometimes called guano crust, and is described as a kind of small soft rock. Of this guano the ship *Matilda*, Capt. STEVENSON, took in 200 tons for dead-weight and dunnage at Bombay in 1865 ; 20 cwt. to the ton. She registers 1,035 tons, is 178·4 feet long, 33·5 broad, 22·2 deep, and has a height of 'tween decks of 8 feet 6 inches. On the guano and in the 'tween decks she stowed 5,400 bales of cotton which averaged 50×26×19 inches, and were placed fore and aft and on end. She left 1st May, and then drew 19 feet 6 inches aft and 18 feet 6 inches forward, and on arrival at Liverpool 8th August, 19 feet and 18 feet ; with 1,520 tons of rice at Akyab, 20 feet 6 inches and 20 feet (**port charges** there £380) ; her best trim at sea is 6 to 10 inches by the stern. At Bombay the bottom dunnage was 15 inches, bilges 24 (guano), and sides 2 inches (bamboos) ; her gross port charges were £550. On 22nd November, 1860, Capt. BRIDGES, ship *Montmorency*, died in Australia. Some

months before, when obtaining guano on the coast of Arabia, his foot was entered by a small Guinea worm, which gradually developed itself and caused death by inflammation; this worm did not come from the guano.

472. A kind of rock guano shipped in the island of **Sombrero** is so heavy that sufficient would be in when it reached a ship's beams. It therefore requires (like copper ore) to be kept well up, and none but strongly-built vessels should take such a cargo. Sombrero is one of the West India Islands, lat. $18^{\circ} 35' 45''$ N., lon. $63^{\circ} 27' 26''$ W.

473. The island of **Navassi**, belonging to the United States, which lies a little to the eastward of Hayti, towards Jamaica, is two miles east and west by $1\frac{1}{4}$ north and south, and is about 300 feet high; it produces a species of guano weighing about 125 lbs. per bushel. Navassi guano partakes almost entirely of the character of a mineral phosphate—contains about 70 per cent. of phosphate of lime, and scarcely a trace of organic matter, and consequently contains no ammonia, and is free from smell. In its natural state it is of scarcely any agricultural value, and is imported solely for the purpose of being manufactured into such artificial manures as derive their value from the soluble phosphates they contain. The Hamburg brig *Partisan*, Capt. TAXT, arrived the 16th July, and left 3rd August, 1867; she registers 290 tons, is 98·8 feet long, 27·70 broad, and 17·1 deep. With 450 tons she drew 12 feet 6 inches aft, 15 feet 6 inches forward; her hold was over one-third but not one-half full; more could have been taken had she been provided with a trunk or platform. With 474 tons Newport coal she drew 16 feet aft, 15 feet 6 inches forward. Her guano was wheeled in barrows to the edge of the cliff, where it ran through a spout into boats for conveyance to the ship, which laid a cable's length off in 15 or 16 fathoms, with good holding ground. Six barrows go to a ton; in fine weather the boats (two) can convey 70 tons in a day; a load is 3 to $3\frac{1}{4}$ tons. Ships ought to be provided with platforms, or they will be liable to strain very much. The time occupied depends chiefly on the number of ships loading. The only **harbour dues** (made after the ship is loaded) are 10c. per ton for shooting the cargo alongside into the tubs. The brig loaded at the south-east point of the island; the prevailing winds are south-east, and the current sets heavily against the wind.

474. A kind of animal guano shipped in the **River Plate** consists of certain portions of the interior of cattle slaughtered in the "salladeras" or abattoirs. This refuse was formerly collected in large heaps for freight: now it is used principally with rib bones for

fuel under the ovens in which export bones are steamed. Three French ships laden with it are said to have been destroyed by fire at sea. An old English barque was laden with it at Buenos Ayres in 1859, and it is questioned that she ever reached her destination. The stench from her cargo extended to a great distance; on board it must have been scarcely endurable. By charter-party one-half of the freight was paid before departure.

475. **Dead Freight.** Court of Exchequer, 20th February, 1858, *KIRK v. GIBBS*. The *Brevet* was chartered to load at the Chincha Islands, but on arrival at Callao, was reported unfit to take a full cargo. She was a North American ship, 1,279 tons register, in ballast, which being improperly stowed, had altered her sheer. After caulking, surveyors reported her capable of taking guano to draw not more than 18½ feet, to which extent she was loaded at the Chinchas, where three masters certified her capable of taking a full cargo. As she was not allowed to take more, the master noted a protest at Callao. The *Brevet* discharged 1,222 tons in London, in May 1855; and Mr. FLETCHER, builder and others, certified her as fit to have brought home 200 tons additional. Defendant among other witnesses, produced Capt. STRONG, H.M.S. *Naiad*, who surveyed 90 vessels a month at Callao; the *Brevet* was long, narrow, and weakly fastened; in consequence of the ballast having been put in the middle, her sheer was altered. Verdict for defendant.

476. **GUM.** A general term given to the juice of vegetables which exudes through the bark of trees and thickens on the surface. Gums are of different kinds and are furnished by different plants. True gum is soluble in cold water, of which that called gum arabic is the type (specific gravity 1.452), but juices having other principles and characters exist, which form on thickening, various kinds of gum, hence we have cherry gum (cerasin), which dissolves in hot water; tragacanth or gum dragon (bassorin), which is insoluble in water, but is capable of absorbing a large quantity and becoming an adhesive paste; also many juices abound in resin and form gum-resins, as assafoetida, benzoin or benjamin, dragon's blood, galbanum, myrrh, olibanum, landrac, copal, &c. Those which consist chiefly of resin are soluble in spirit or naphtha and in oil, forming the various kinds of varnish.

477. **Kauri gums** are dug from under the sand in the deserts of New Zealand, and are supposed to have flowed from pines which have long ceased to exist. They are conveyed in bulk to vessels of 106 to 200 tons, which go to the superior ports and transfer them to larger ships for freightage to Great Britain, &c. Kauri gums are said to be very inflammable, and some masters will not permit an unprotected light to be brought near them, or wool to be stowed in close proximity. Water will not injure kauri gum, which is soluble only in oil, or when heated like resin; in fact it is a kind of resin,

and is used in making varnishes ; it should, of course, not be placed near casks of oil. Packed in bags or casks it is considered very convenient for stowing in the peaks. The best sort is in clean large lumps, and it is very desirable not to knock about the packages unnecessarily, because it reduces the value. If bags belonging to different consignees get rotten and break adrift in the hold, each consignee will maintain that only the large white lumps were in his bags, and considerable difficulty will be created in settlements for freight ; the ship must suffer ultimately. The separate consignees' marks should if possible be stowed apart from each other. Masters should insert in the bills of lading "not accountable for damage through the rottenness or decay of the bags." It is desirable to be paid freight for gross weight at the Queen's beam—say 20 cwt. to the ton. A ship will only take her register tonnage of kauri gum. It is shipped all the year round, and is packed in bags, cases, casks, &c, of various sizes, and sometimes in bulk. In this way 320 tons were sent, in July, 1864, on board the barque *Sir George Grey*, Capt. PRINCE GILPIN, which registers 376 tons, is 132 feet long, 27·2 broad, and 16·2 deep. With the gum, 40 tons of whale oil in casks, and 40 tons of copper dross, which was made level with the keelson, she drew 14 feet on an even keel. With a dead-weight cargo, say 500 tons of coal, she draws about 16½ feet aft and 16 forward ; her best trim at sea is 14 feet aft and 13½ forward. Capt. PHILIP says, 28th November, 1864, the gums per *Transatlantic* were in cases of different sizes, weighing from 2½ to 5 cwt. each ; the bags average 17 to 18 per ton of 20 cwt. ; they were ordinary biscuit bags—say 6 lbs. each. He thinks that, with Sydney cargoes, bags of gum should be stowed only in the peaks or ends of the ship, where they can be placed more advantageously than bales of wool. Capt. STUART writes 28th November, 1864, the kauri gum we bring from Sydney is in bags of from 1 to 2 cwt. each. We take it for broken stowage—with bales of wool—in the sharp ends of the ship and for beam fillings. It does not injure the wool, neither is it injured by wool. Sometimes it is shipped in cases and casks of all sizes, at a higher rate of freight—mostly 40 feet to the ton ; it is then stowed with other dry goods.

478. Gum, copal, is collected in quantities on the island of Zanzibar (see orchilla), and is brought there also from the main. It is subjected to a tedious and expensive process of cleaning, and is then carefully picked over, and the different qualities selected for packing in cases weighing about 2 cwt., and freighted 50 cubic feet to the ton.

Tonnage. Bengal ton 50 cubic feet in cases, not enumerated; Madras 50 feet in cases, 18 cwt. olibanum in bags; Bombay 50 feet in cases, 16 cwt. olibanum in bags. Gum arabic—an East Indian chest 6 cwt., Turkey chest 4 cwt.

479. GUMLAC is a resinous coloured substance produced by a species of ant, a native of the East Indies, which abound on trees on the banks of the Ganges. Seed-lac and shell-lac are produced by the same insect.

480. GUNJAH, a name in India for the dried hemp plant *Cannalis sativa*, which has flowered, but from which the resinous juice has not been removed. It is chiefly sold for smoking with tobacco, is made up in bundles about two feet long and three inches in diameter, containing 24 plants, and is usually carried coastwise. Bengal and Madras ton 50 cubic.

481. GUNNY BAGS, gunnies. Gunny cloth is a name for coarse strong sacking made in India, and much used for bags and bales for wrapping rice, spices, and other dry goods. In Bengal, gunny cloth is made of jute, the produce of a species of *Corchorus*, and is exported either in pieces, or made up in bags. The gunny bags of Bombay and Madras are, however made of different kinds of sunn fibre, the *Crotalaria juncea*. They are usually shipped in bales from 200 lbs. to 300 lbs. each and are taken as light freight. Bengal and Madras ton 50 cubic feet. If a large number of gunny bags are heaped together and they become damp, spontaneous combustion will be produced. In 1863, the schooner *Dependant* left St. Helena for England with a general cargo. After passing the equator there was a smell of fire in the forecastle, the bulkhead was accordingly cut away, and some of the goods removed through the main hatchway, to the deck. The fire was on the starboard side, between the main and fore hatches, but it could not be extinguished until Capt. ALCOCK and the steward, at the risk of being stifled, crept over the cargo and discovered the exact portion burning—some gunny bags which had been put on board damp, and were stowed between casks of oil, near a bundle of sheep skins. It is supposed that the fire was caused either by friction, as there was a fresh breeze, or through spontaneous combustion generated by dampness and the great heat which prevailed. The Liverpool Shipowners' Association has issued the following caution to masters:—It has come to the knowledge of this Association that notwithstanding the existence, both at Bombay and Calcutta, of a recognised tonnage schedule, which fixes the ton of measurement goods at 50 cubic feet, a

practice has grown up in the trade between Calcutta and Bombay, of inserting in charter-parties a clause, that bales of gunny bags should be "at the rate of not over 14 cwt. $\frac{1}{2}$ ton." This involves a heavy loss to the ship, since 14 cwt. gunnies in bales loosely screwed, as they usually are to avoid expense, represent a measurement from 100 to 110 cubic feet.

482. *NICOL v. BOYD*. Supreme Court, Bombay, 17 June, 1862. The ship *East* was chartered 29th September, 1860, to proceed from Bombay to Kurrachee, thence to Calcutta, and back to Bombay. At Calcutta she was to be provided with "a full and complete cargo of lawful merchandize according to the Calcutta tonnage scale, in proportion as follows, viz. :—1,100 tons, being two-thirds of the cargo, shall consist of goods after the rate of 20 cwt. per ton, and the remainder, being not more than one-third, at the rate of 14 cwt. per ton." The ship brought from Calcutta a large quantity of gunnies. In the Calcutta scale they are put down at 50 cubic feet to the ton, and the question was whether freight was to be paid by weight or measurement. The master claimed by measurement, 44,000 rupees, which were paid under protest. The court gave a judgment for plaintiff for 5,908 rupees with interest at 9 per cent. from 16th May, 1861, to judgment, and 6 per cent. from judgment to payment, with costs. Mr. WESTROPP, plaintiff's counsel, stated in the course of the trial, that gunny bags always expand during such a voyage as the one in question.

483. GUNPOWDER. The component parts are 77 lbs. saltpetre, 10½ lbs. sulphur, and 16 lbs. charcoal in every hundred pounds of gunpowder. Cylinder powder is made from charcoal burnt in iron cylinders; pit powder from that burnt in common pits. One pound of powder measures, on an average, 32 solid inches, and a cubic foot weighs 58 lbs. Specific gravity 0.836 loose, 1.745 solid.

484. By the Explosive Act of 1875 the term explosives mean—gunpowder, nitro-glycerine, dynamite, gun cotton, blasting powder, fulmate of mercury or other metal, coloured fires, and every other substance, whether similar to the above-mentioned or not, used or manufactured with a view to produce practical effect by explosion or a pyrotechnic effect; and includes fog signals, fireworks, fuses, rockets, percussion caps, detonating cartridges, ammunition of all descriptions, and every adaptation or preparation of and explosive as above defined. Harbour authorities have power, by sec. 34 of this Act, to make bye-laws for regulating the conveyance of explosives. Penalty for breach of same £20; and £10 per day for every day during which the offence continues.

485. During its shipment all fires, lights, and smoking should be strictly prohibited. The packages require to be carefully handled, especially in the vicinity of iron, and stowed immediately on reception. Should there be no regular magazine, a temporary one may be constructed among the cargo least inflammable, and as remote

from iron as possible, by flooring over a sufficient space, bulkheading it round, and lining the interior with blanketing or other woollen stuff, being careful to close all openings, particularly in the flooring, to prevent any loose powder, which may escape, from finding its way among the other cargo. The magazine should, if possible, be constructed near a hatchway, for facility of access in case of accidental fire, and for convenience of stowing and discharging—powder being generally the last article shipped and the first discharged. The Admiralty instructions are—"whenever any quantity of gunpowder, ammunition, or combustibles exceeding 20 feet, is shipped in a hired vessel or freight ship, or any similar articles are shipped in the same vessel on private account, they must be properly secured by the owners in a magazine, fastened with copper nails, and provided with a copper padlock, with appendages for the door. The same regulations are to apply in all cases to ships engaged for the conveyance of troops when the number of men exceeds fifty."

486. When government powder or combustibles are shipped for conveyance under the Admiralty regulations, a magazine or place of security, if considered necessary by the authorities, is built by and at the expense of the crown; and in freight ships the owners are paid freight on the external measurement, and not on the tonnage only, of the powder or combustibles. The magazine is to be returned to the government. A magazine, however, is not required for the following small quantities :—

1st.—Powder alone, 20 feet.

2nd.—Ammunition alone, 20 feet

3rd.—Powder and ammunition (stowed in one case), 20 feet.

4th.—Combustibles, 20 feet.

Nor is a magazine required when only 20 feet of combustibles are shipped in the same vessel with only 20 feet of the articles Nos. 1 to 3. These quantities under 20 feet, are to be stored by the shipowner in a place of security, approved by the surveying officer.

487. When ammunition, rockets especially, are stowed in a magazine in the after part of a screw steamer, every precaution should be observed to prevent movement by the action of the propeller, as the friction may create ignition; this is suspected to have occurred on board the steamer *Rangoon*, in 1865. In the African trade, a ship of 700 tons takes about 35 tons gunpowder, deposited in a magazine constructed by a bulkhead in the lower hold, across the run, decked over with a scuttle-hatch having leaded seams; see palleting. A shipmaster is liable to a penalty of £20, besides 2s. for every pound of gunpowder not delivered into a licensed magazine,

which is, in all cases, two miles at least from a church; see ammunition. Most of the Indian policies of insurance except, by memorandum, all loss by carrying gunpowder as cargo. Ships proceeding to Calcutta, land it at Moyapore. At the Phillipine Islands vessels are required to deposit their powder in closed and marked packages, on their entering the river, or pay a fine of a piastre (4s. 6½d.) for every pound retained on board. In some ports it is imperative, under penalties, to give notice to the authorities, and to land powder within a stated time, before landing other cargo.

488. At Liverpool, March, 1865, Mr. M'IVER prosecuted Mr. M'PHERSON, agent for Mr. C. O. BLAKE, London, for sending "prepared tan" by the steamer *Australasian* to New York; the article was in reality a powerful blasting powder, liable to instant explosion by heavy pressure; fined £5 and costs.

489. **Dangerous Goods?** A Hanoverian master writes to the *Gazette*, 5th January, 1857: My vessel of 105 tons register, and about 150 tons burthen, is chartered to load, in the port of London, a cargo of lawful goods and merchandize, as the charterers shall tender alongside for shipment. Having received about three-fourths of my cargo in the docks, I am now directed to proceed to Purfleet, to receive 1,200 casks of powder. There being no clause in my charter which would lead me to believe that I had to load at two different places, and knowing that powder is not allowed to be shipped in the docks, I did not think of using the precaution to exclude it. I, therefore, desire to know whether my charterer can insist upon my taking powder on board under the name of lawful merchandise, and if so, what quantity of this dangerous article you would consider to be in conformity with the custom of the port, for a vessel of my size?" Answer: "Although by the Customs' Consolidation Act, gunpowder is not unlawful merchandize, unless made so by proclamation, still, by the Merchant Shipping Act of 1854, section 329, no person is entitled to require the master or owner of a ship to carry gunpowder, or any other goods, which, in the judgment of such master or owner, are of a dangerous character; and, presuming that the charter-party was made here, the master has the power, under this act, to refuse to take gunpowder on board."

490. **Explosion.** The bark *Lotty Sligh*, 322 tons, Capt. WEBBER, was in the Mersey, 16th January, 1864, loading for the West Coast of Africa. She had a general cargo including 949 kegs of gunpowder, about 15 lbs. each (11½ tons), stowed in the lazaretto under the cabin. At six in the evening the steward was trimming the lamps with petroleum oil which exploded. The fire from the bed curtains and bedding soon filled the cabin, and being fed by the petroleum, prevented all efforts to extinguish it, and the master and crew were compelled to abandon the ship. At half-past seven a huge volume of smoke and water, surrounded by a sheet of flame, shot up to a great height carrying the masts and yards with it, after which all became inky darkness. Fragments of the ship were scattered in all directions, a large number of the gas lights in Liverpool and Birkenhead were suddenly extinguished, and an immense quantity of plate glass was demolished.

Tonnage. 2,000 lbs. go to a ton for freight; in Australia it is freighted by measurement, at double the ordinary rates. A barrel contains 100 lbs., half-barrel 50, quarter 25; it is also made up in small oak barrels, containing 8, 10, 12½, and 20 lbs. A last is 24 barrels, or 2,400 lbs.

DIMENSIONS OF ADMIRALTY POWDER PACKAGES.

NATURE.	WHOLE.	HALF.	QUARTER.
	inches.	inches.	inches.
Barrel, depth..... ..	20	16	14
„ diameter	16	13	10
Case, length	17	13	10
„ breadth	17	13	10
„ depth	20	17	14

491. GUNS weighing between three and four tons each, and requiring, consequently, much time to receive and discharge them, may be objected to at the time of shipment, as being cargo which a ship can “conveniently stow or carry,” and not so noted in a protest. Guns are, however, “lawful merchandize,” unless prohibited by order in Council; for stowage see ammunition and iron.

MUZZLE-LOADING RIFLE GUNS.

Nature of gun.	Weight.	Diam. of bore.	Length.	No. of grooves.	Common shell.	Bursting charge.	Chilled shell.	Bursting charge.	Shrapnell shell.	Bursting charge.	Case shot.	Nature of Rifling.	Charges.
in.	tons.	in.	ft. in.	No.	lbs.	lbs.	lbs.	lbs. oz.	lbs. oz.	oz.	lbs.		lbs.
9	12	9	12 3	6	250*	18	250*	2 13	250* 0	12	101	W.I.	43 30 15
8	9	8	11 4	4	180*	13	180*	2 0	182* 8	10	70	W.I.	30 20 12
7 shunt	6½	7	10 5	3	115*	8½	—	—	111* 8	8	67	W.U.	22 14 10
64 pr.	3½	6	9 3	3	64*	7	—	—	66* 2	5	48	shunt	— 8 6

* Weight of shell when loaded

Length of projectiles, common shell, 9 inches, 8 inches, 7 inches, about 3 diameters. Chilled shot or shell, 9 inches, 8 inches, 7 inches, about 2 diameters. Shrapnell shell, 9 inches, 24·18 inches; 8 inches, 22·38 inches; 7 inches, 17·95 inches. Double shell, 7 inches, about 4 diameters.

For a 7-inch gun the *weight of a double shell* when loaded is 158 lbs.; bursting charge 12 lbs. 12 oz.; and of a chilled shot for a 7-inch gun is 115 lbs. The *twist of rifling* of a 9-inch gun is 1 turn in 45 calibres; 8-inch gun 1 turn in 40 calibres; and 7-inch gun 1 turn in 35 calibres.

492. **GUTTA PERCHA**, a vegetable product obtained from trees in Borneo, Malacca, Singapore, &c. ; it is highly inflammable, but impervious to water or damp, and is generally taken with other goods, say 200 tons in a ship of 800 tons burthen. Dunnage with wood, and mat the sides ; in a raw state it contains foreign substances, such as wood bark, &c., which will absorb water, or very little dunnage would be necessary. Gutta percha is stowed in bulk, excepting the small pieces which are in bags ; it is liable to be damaged by any sticky goods, such as cutch, gambier, sugar, tar, &c., and will injure tea, rice, and other delicate articles. Specific gravity 0.925. India rubber in a crude state is imported into England chiefly from Para in South America. The first quality is known in the market as Para rubber, second as gutt, and third as negro head. It is sometimes stowed in the same hold with nuts, which when heated, exhude an oil very injurious to the rubber, as is the case with all fixed oils. Clothing and other articles made of rubber should be stowed in a cool dark part of the ship. In the Southampton docks an extra charge is made for separating such articles as india rubber, cutch, gambier, &c., in an adhesive state. The charge in the London docks is 3s. 6d. per man per day, and the cost of repairing the instruments used.

493. **HAIR**, from Rio Grande, is sometimes injured by contact with bone ash ; see Liverpool letter, article ores, and see hides.

494. **HAMS**, from Ireland, are usually packed like bladder lard, in casks, on the heads of which the number and weight of contents is generally marked ; the cask and packing is not included in the weight ; freight is, therefore, calculated on the net weight ; see bacon. In computing the freight of hams at Baltimore, 200 lbs. net weight are considered equal to the freight of a barrel of 5 cubic feet. American hams and shoulders are sometimes packed in hogsheads, 8 cwt. each.

495. **HANGING BEDS** ; pieces of wood set on end between casks in a tier, so as to keep the bilges finger free from each other. The pieces are set against the quarters, with an inclination towards the bilge, so that if there should be any shaking of the casks, they will fall inwards and be secured, rather than outwards and be lost. Sometimes these pieces are quoined above against the quarters, by wedges falling between them and the quarters, and sometimes keyed below by pieces in a line with the casks.

496. **HARE SKINS**. 3,500 go to a ton. The Baltic rate is the same as for clean hemp per ton.

497. HARTALL, or Orpiment, a Chinese native sulphuret of arsenic. Bombay ton 50 cubic feet in cases.

498. HATCHWAYS AND HATCHES. See the article mate. In the Second Court, before Justice MELLOR, 6th July, 1865, HIBBS *v.* ROSS. Plaintiff was master of the ship *Moulashé*; in the previous December she was moored in the Surrey dock outside the *Jarnia*. Persons wanting to go on board the *Moulashé* were in the habit of passing over the *Jarnia*. At 8 p.m., 24th December, plaintiff was going on shore and crossing defendant's ship, when he fell down her hatchway. It was extremely dark, plaintiff was taking the same course as he took by day but he tripped and fell down the hatchway—21 feet. He was insensible and knew nothing of what had occurred till late the following day; was confined to his bed on board twenty-eight days, and was then removed in a cab to his lodgings. He was still suffering, and had not been able to obtain employment since. There was no mode of getting on shore but by crossing the *Jarnia*. On the part of the defendant it was urged that there was not such negligence as would render him liable. The Judge, however, thought that for the purposes of the day there was; and the jury awarded £450 to plaintiff.

499. HAY requires a full amount of ballast; dunnage with boards in the wings. In a damp hold hay is liable to become overheated, and should be stowed so as to allow a current of air to pass from one hatchway to another. A government officer recommends a large cargo to be divided about half-way up, and a space of about a foot to be kept clear with old spars or other dunnage, laid fore and aft. There should also be a well of about four bales space, kept clear from the upper deck to the bottom of the ship. A vessel laden with hay in a damp state had her decks so much injured that they were obliged to be renewed, although she was but three years old. The ship *Marathon*, from Bristol, with 700 tons of hay for Constantinople, out 30 days, put into Plymouth, leaky, 16th January, 1856. Her cargo had become so much heated that for many days the crew were driven from the forecastle to the cabin; and the hatches of the forecastle and the hold, the chain boxes, and every aperture communicating with the cargo, had been carefully battened down and covered with tarpaulin, to prevent the fire from bursting into a flame. The ship *Oriflamme*, Capt. SMITH, left Bombay 31st May, 1865, for Liverpool. On the 22nd June, lat. 16° 15' N., lon. 27° 3' W., a fire broke out in the hold, which was not extinguished until after twenty-eight hour's exertion. It is supposed to have originated in a cask or crate of goods packed with straw. In

emigrant ships all hay and straw must be carried on deck, at a distance from the galley, and covered with canvas. It is usually stowed in the chains and on the quarters of ships leaving Calcutta in fine weather. At Port Louis, vessels requiring hay for the purpose of their voyage, are not allowed to remain the night at anchor, or on the warps in the harbour, after it is on board; and if ready to sail, must run out and anchor at the Bell Buoy. Neither hay nor cotton can be allowed to remain on the wharf during the day, unless under a special guard; nor can such be suffered under any circumstances to remain there during the night.

Tonnage. The Admiralty allows 500 lbs. pressed hay to a ton. Ordinarily compressed hay in trusses measure about 2 feet 4 inches \times 2 feet 6 inches \times 3 feet, and will average about 270 lbs. per truss, occupying say 140 feet per ton for stowage, which hydraulic pressure will reduce to 105 feet per ton.

Hay and Straw. 36 lbs. make 1 truss of straw; 56 lbs. 1 truss old hay; 60 lbs. 1 truss new hay; 36 trusses 1 load; 18 cwt. 1 load old hay; 19 cwt. 32 lbs. 1 load new hay; 11 cwt. 64 lbs. 1 load straw; 1 square yard of new hay 6 stone, oldish hay 8 stone, and old hay 9 stone. Hay is considered as new for three months, and is called old on the first of October. The Admiralty estimate a bundle to weigh $4\frac{1}{2}$ lbs. per cubic foot; trusses supposed to weigh 56 lbs. vary from 52 to 58 lbs.; straw in bundles $3\frac{1}{2}$ lbs. per cubic foot vary from 30 to 50 lbs.

500. **HEMP**, or *cannabis sativa*, being a plant of rapid growth, sucks up much of the unaltered soil, and therefore differs greatly according to the soil as well as the climate and culture. Riga produces the best in Europe, well known as "Riga rhine;" the next is Petersburg braak or clean; then Riga pass or half-clean, hemp from Königsberg, Archangel, Sweden, and Memel. Another authority says Riga hemp is designated Rein or Rhine, outshot, pass, and codilla; Petersburg is termed clean, outshot, half-clean, and codilla. Riga outshot and Petersburg outshot come next in rotation to Riga rhine and Petersburg clean; then pass and Petersburg half-clean. "Kaarle" means inferior as applied to hemp or hemp seed, or both. When hemp arrives at Petersburg from the growers, it is sorted or "braacked" into three qualities—clean, outshot, and half-clean; this sorting was formerly done by the government, now (less efficiently) by the merchants or dealers. The clean is long and strong; outshot shorter and weaker; half-clean still shorter. In Riga the assortment of Ryne, outshot, and pass is "braacked" as at Petersburg. In chartering at **Petersburg**, when clean hemp obtains 40s. per ton freight, outshot gets 2s. 6d., and half-clean 5s. additional. At Riga, when clean hemp, Rhine, outshot, and Dwina pass obtain 50s., coarse Polish, and Ukraine pass get 52s. 6d. In other words, 2s. 6d. \varnothing ton, and 5s. \varnothing ton additional are usually paid

for the coarser descriptions. The quantity delivered is generally greater than that charged in the bill of lading.

501. The **first season** for pulling clean hemp, the roots being available, is in August. Russian hemp, shipped in the Baltic, is usually of the growth of two seasons previous, that is, hemp grown say in 1860 gets down for shipment in 1862; through accelerated modes of transit, large quantities of one season old only have latterly been shipped in August, September, and October. Hemp generally arrives at Riga about the middle of May; this hemp, especially if gathered in wet seasons, and if great care is not taken in its preparation, is very liable to get heated in the hold, and will become seriously damaged from natural moisture when the voyage is a long one. In the summer the sun's rays make the decks above extremely hot by day—by night they become very cold, particularly underneath; this creates condensation, which drops on and injures the cargo. On the voyage home, or when at anchor at Elsinore, &c., the hatches, during fine weather, should be open, to counteract the injurious effects of heating. Particular care must be taken to ship hemp and flax in fine dry weather; if they get wet they heat and are materially injured; for this reason every vessel must be furnished with mats when loading.

502. The **ballast** used in Cronstadt, St. Petersburg, and Riga, is generally stone, which is planked and double-matted. In some Russian ports the ship is ballasted on dunnage of light wood, with bar iron, stowed cross ways, so as to admit the air; the iron is covered with mats to receive bales, and in large ships they are covered with mats to receive a second ballasting of iron. Hemp should be **dunnaged** about 9 inches on the floors, and to the upper part of the bilge; the wing bales of the second tier kept 6 inches off the side at the lower corner, and 2½ inches at the sides; sharp-bottomed ships one-third less dunnage in floor and bilges. Double mats are also carried up the sides and are placed round the masts, pump-well, &c., and under the hatchways. Iron knees, bolts, &c., must be well dunnaged, as by contact they greatly injure hemp, more especially when leakage occurs near. Some importers do not consider mats to be of much use.

503. Being light and bulky hemp is forced by screws, which renders the operation rather slow: stevedores require to be watched or there will be great loss of space. On the other hand care must be observed not to overscrew in any particular direction, or the ship will be strained and become leaky at sea. Sometimes the lashings or bands of the bales (which are usually made of codilla or other

inferior hemp) are cut for the purpose of stowing; this should be avoided as much as possible, because the value of the hemp is thereby deteriorated. The stevedores at **Riga** through greater skill, are reputed to be able to stow 10 per cent. more in a ship's hold than those at Petersburg and Cronstadt. At Riga the ship finds dunnage, the merchant mats; lathwood is generally used. During the passage the natural heating of the hemp draws out the sap from the slab-bards (lathwood) and then the hemp contiguous becomes rotten, so that oftentimes without any leakage, a ship delivers two or three tons damaged hemp including the bands. When a bale is opened, the bands (four or five), are, in some ports, thrown on one side and sold with the damaged hemp.

504. In steam-ships the heat from the fires, like the over-heat from the sun, dries up the moisture of hemp and weakens it, but after landing and exposure to air, under shelter, it will, if not too much heated, recover a portion of its strength. A lengthened passage in a steam-ship may do serious injury to hemp. When it is stowed in an iron ship every part of the cargo must be dunnaged off completely, so as to prevent contact, or the hemp will be damaged, especially if any leakage occurs. Dampness from hemp will oxidize iron.

505. Oil, linseed oil especially, and tar, if allowed to leak on hemp, may produce spontaneous combustion. The steam from artificial manures will ruin hemp and flax. The dangerous consequences of stowing hemp, jute, oil, tallow, and tobacco in the same place, is supposed to have been exemplified by the destruction and fatal fire at **COTTON'S Wharf**, London, 22nd June, 1861. A ship discharging Venetian hemp at Devonport, in 1855, was put under detention in consequence of the discovery of stray lucifer matches in her cargo, supposed to have been dropped by the stevedores; in Philadelphia no vessel loading or discharging hemp at a wharf is permitted to have a fire; nor on board any other vessel lying near if considered dangerous; see the articles flax and rope, and for the seasons of shipment in the Baltic, see the article grain.

506. Ships will not stow their register tonnage of hemp, and speed is now of such great consideration that they do not carry so much in proportion to that tonnage as formerly. It must, however, be stated that hemp, especially at Petersburg, is not packed so closely now. An experienced merchant says "a Channel-built ship will not stow two-thirds of her register; a Scotch ship of 120 tons would carry perhaps 100 tons of flax, or if fine 110 tons." Pressed-packed bales of hemp stow, of course, closer than unpressed.

Italian hemp is packed closer than Baltic; iron bands are sometimes used. A ship will stow 10 or 15 ¢ cent. more flax than hemp. The schooner *Ada*, of Runcorn, registers 102 tons, and took in at Petersburg in October, 1865, 65 tons of hemp; with this, 10 tons stone ballast, and 5 tons kentledge, she drew 8 feet 4 inches aft; with a dead-weight cargo she draws 11 feet 6 inches.

**DETAILS OF THREE CARGOES OF HEMP DISCHARGED AT
PLYMOUTH IN 1865.**

Date.	Ship.	Tons reg.	From.	Cargo.	Tons freight.
May 2	CHRISTINA ...	331	Venice ...	850 bundles hemp 209 4,440 walnut planks 101 200 bundles whisk for brooms, } 6 say 227 dunnage mats —	316
Sep. 15	WILHELM	151	Riga	395 bundles hemp 110½ 154 packages flax 20 150 dunnage mats —	130½
Oct. 11	ELIZA WALKER	95	Petersburg	154 bundles rough hemp and a quantity of dunnage mats	69½

The Cargo of the *Elisa Walker* was discharged at the dockyard, Devonport, where the authorities

	tons.	c.	q.	lbs.
Accepted as fit for government use	59	5	3	21
Objected to as unfit, (including the bands of the cargo)	6	7	1	0
Damaged by bilge-water	3	12	3	7
Gross cargo	69	6	0	0

The *Elisa Walker* is of composite construction by JORDAN. Her bottom is timber; the frame of her sides is iron; and the planking, two diagonal layers, is fastened with yellow metal bolts to the frame. No dunnage was used between the hemp and the sides. With this cargo her mean draught was 6 feet 6 inches: with a dead-weight cargo of 156 tons, 8 feet 6 inches.

507. Of late years quantities of **yarn** have been shipped at St. Petersburg and other Baltic ports. It is usually coiled on winches, (wooden reels) which are stitched in matting. The packages have the appearance of barrels, but they do not taper so much in the

ends; six usually go to a ton, and the freight is *2s. 6d.* less than 'for clean hemp.

508. In the northern island of **New Zealand** and in Cook's Straits, hemp is made up in bales of about the same size as those of cotton, pressed in a similar manner. It is generally brought from Australia as light freight, and is stowed over oil, tallow, &c.; this hemp is very clean, and there is little or no steam from it. Large quantities come to England as lashings for bales of wool, there being sometimes five or six about each bale. In a cargo of 3,150 bales upwards of 25 tons of hemp were used for lashings. More hemp is produced in the northern than in the southern island of New Zealand; the season is from the beginning of November to the beginning of March. Bales of hemp made up in the Phillipine Isles, measure about 10 cubic feet and weigh 280 lbs. Manilla bales are packed very neatly and stow well.

509. **Damaged Cargo.** At Liverpool, January, 1858, *BENCKE v. WILKINSON*. Plaintiff sought to recover £9 compensation for damage to a parcel of hemp, shipped on board the *Persverance*, from Riga. It appeared that, according to charter-party, the cargo was not to be opened or broken up, or the cordage cut, and no damp wood was to be stowed among the bales. Plaintiff contended that damp wood had been used as dunnage, and had caused the damage, and the evidence of his witnesses went to show that the damage was of such a character as could not have been caused by any other means than through the dampness of the dunnage. Defendant contended that any damage which had occurred was caused entirely by sea damage, and consequently was not such as the owner could be held responsible for. Several witnesses were called, among others the defendant, who stated that, from his own observation, the vessel had been leaking to some extent, as might have been expected from her condition, and the admission of salt water. The stevedore who unloaded her proved that she had been making water to some extent in the sides, which would run down among the hemp; the dunnage and stowage very good. Capt. ALLEN, surveyor to the underwriters, considered that the hemp had been well stowed, and that the dunnage was particularly well put in. He observed that some of the hemp had sustained damage; but that was only such as might arise from salt water; had been in the Baltic trade, and knew that hemp was a difficult cargo to stow, being apt to sustain injury from the access of water, even in small quantities. In commenting on the evidence, Mr. FORSHAW maintained that the witnesses for defendant had not succeeded in establishing that the damage had been occasioned by sea damage, while the evidence of his witnesses was to the effect that the damage was only traceable to the position of the dunnage wood. Mr. Commissioner BLAIR said that there were points in the evidence which appeared to favour the impression, that being an absorbent of moisture, the damage might have arisen from sea-water. He took time to consider, and a few days afterwards gave judgment in favour of the defendant.

Proportionate tonnage, &c. The following quantities are required to fill a keel of 850 cubic feet, or 97 quarters wheat, viz.: 10 tons clean hemp and flax; 9'107 outshot ditto; 7'760 half-clean ditto; and 5'825 codilla. 63 poods gross

Russian clean make a ton for freight. 40 lbs. Russian make a pood. Bengal, Madras, and Bombay ton 50 cubic feet screwed bales; Bombay 7 cwt. loose or bundles. Manilla is mostly shipped by weight; 1 ton (20 cwt.) will make about 2 tons measurement of 40 cubic feet for American ships; when sugars are freighted at 10 dollars per ton of 20 cwt., hemp and other light freight are rated at 12 dollars per ton of 40 cubic feet.

Freight. When wheat is 10s. $\frac{7}{8}$ quarter freight, clean hemp and flax is rated at £4 17s. 0d. $\frac{7}{8}$ ton; outshot at £5 6s. 11 $\frac{1}{4}$ d.; half-clean £6 5s. 0d.; and codilla £8 6s. 4 $\frac{1}{4}$ d. Another authority says, when wheat is freighted at 1s. $\frac{7}{8}$ quarter, clean hemp is rated at 10s. 6d. $\frac{7}{8}$ ton of 20 cwt.; outshot should be 1-10th; half clean 3-10ths; and codilla 7-10ths more than clean hemp $\frac{7}{8}$ ton of 20 cwt.

Weights. A stone is 32 lbs.; a bale nearly 20 cwt.; a bale of St. Petersburg clean hemp weighs from 55 to 65 poods; outshot 48 to 55; half-clean 40 to 45. A pood weighs 36 lbs. avoirdupois; 63 poods an English ton. 6 $\frac{1}{4}$ shipp of flax or hemp=1 ton English. A ton will occupy 88 cubic feet. A bale well screwed averages 2 $\frac{1}{2}$ feet thick, 5 feet high, and 7 feet long. Bales of St. Petersburg clean are now mostly 6 cwt. to 10 cwt. each pressed. A bale is made of a number of bundles or heads weighing 16 to 18 lbs. each.

510. HERRINGS should be stowed the same as a wet cargo, say wine or oil, for which see casks, liquids and oils; the ground tier to be made square; small casks at each end; keep as level as possible to come in for heights at top. In general cargoes avoid stowing red herrings so as to leak on perishable goods. For the purpose of levying import duty, the Russian government divide herrings into three classes, viz.: first quality, Dutch 9s. 6d. $\frac{7}{8}$ barrel of 9 poods; second quality, Scotch and English 4s. 4d.; and third, all others inferior, 3s. For white herrings, the *staves of barrels* are usually of Norway birch and ash; for red or smoked, of fir.

Tonnage, &c. 180 barrels red herrings, weighing 11 tons, or 144 white 21 $\frac{1}{2}$ tons, will occupy a space of 850 cubic feet or 1 keel. On the Crinan Canal 8 barrels of herrings go for a ton freight. When wheat is 1s. $\frac{7}{8}$ quarter freight red herrings are rated at 6 $\frac{1}{4}$ d., and white is 8d. $\frac{7}{8}$ barrel.

Measures. A last of herrings is 12 barrels; a barrel 26 $\frac{3}{4}$ imperial gallons; a cran 27 $\frac{1}{2}$ ditto; a measure 600 fish; and a cade, mace, or maize 500 fish. In some places a last consists of 20 cades, each cade a 1,000, and every 1,000 ten hundred, and every 100 five score; 18 barrels of unpacked herrings make a last. In Norway a last 224 lbs. English; Denmark 224 lbs. net; Bremerhaven, a ship last 12 barrels; Rotterdam 14 barrels.

511. HIDES are shipped in immense quantities at Buenos Ayres, Monte Video, and other ports in the River Plate, and at Rio Grande do Sul, 300 miles north. The harbours are shallow; good anchors and cables are very necessary; produce is brought off principally in lighters (balandras), and when they come alongside in the River Plate on a Sunday or holiday, it is customary to receive their cargoes at once; otherwise the refusal will bar the ship from

all claims for demurrage. This custom originates through the fact that the weather the next day might prevent the transshipment from the lighters; indeed, they cannot lay alongside should there be the least swell. The **season of shipment** is from November to July; the largest shipments occur from December to May. Ships are generally addressed at Buenos Ayres, to the agent of the charterer, whose commission is from $2\frac{1}{2}$ to 5 per cent. on the freight. Although instructions for the stowage of tallow, bones, bone ash, horns, hair, &c., are given in this work under their several headings, in alphabetical order, yet they are so intimately connected with the stowage of hides, that it becomes necessary to refer to them here also.

512. A heavy ox-hide will measure 7 feet long by 5 feet 9 inches wide; light hide 4 feet 10 inches by 4 feet 4 inches; average 6 feet 6 inches by 4 feet 6 inches. A salted ox-hide weighs from 42 to 89 lbs. Below are the details of a cargo landed at Plymouth.

HIDES ex FLORENCE NIGHTINGALE, 1864.

NO.	DESCRIPTION.	WEIGHT.			AVERAGE.
		cwt.	qr.	lbs.	
6,235	Heavy ox	3,504	2	17	62 $\frac{1}{2}$
942	Light ox.....	405	1	6	48 $\frac{1}{2}$
56	Cows	21	0	26	42 $\frac{1}{2}$
44	Bulls	34	3	22	89
370	Heavy ox (bad condition)	267	3	25	81 $\frac{1}{2}$
7,647		4,234	0	12	62

Besides the hides the ship *Florence Nightingale* had 114 cwt. 13 lbs. of tallow and 495 cwt. of bones; in addition she had 570 cwt. for dead-freight; her register is 447 tons, and dimensions 140·8 feet long, 26·7 broad, and 18·2 deep.

513. The Danish brig *Mercur*, Capt. HANSEN, 102 English tons, 59 Danish lasts, took in at **Rio Grande** in September, 1862, 2,500 salted hides and 5,200 dry hides, with 6,000 horns for dunnage. No. ballast. So laden she drew 9 feet 9 inches aft, 9 feet forward. With a little over $7\frac{1}{2}$ keel Newcastle coal, say 160 tons, she draws 10 feet 2 inches aft, and 9 feet forward.

514. It is usual to calculate that the carcasses of 7,000 animals will produce 280 pipes of tallow, and when freighting a ship with hides and tallow, about that proportion, say 35 pipes to every 1,000 hides, is generally agreed on. 1,000 ox-hides with the necessary salt, weigh about 30 tons. Masters should see that the number

charged is received; those sent with the hair loose, should not be received without previous communication with the shipper, because it is customary to make the ship answer for bad stowage, to which the loss of the hair may be attributed on delivery. In the **River Plate**, pipes of tallow are ordinarily stowed on the ground floor, with a layer of bones or horns to receive hides, otherwise there should be

FOUR CARGOES OF HIDES DISCHARGED AT PLYMOUTH IN 1867.

Brig <i>Adela</i>, 227 tons register, Measurement 109 × 23'2 × 13'7 ft. From Buenos Ayres.					Brig <i>Urania</i>, 197 ton register, Measurement 94 × 24 × 14 feet. From Uruguay.				
	tons.	c.	q.	lbs.		tons.	c.	q.	lbs.
Hides	198	12	2	0	Hides	198	15	0	0
Tallow	62	19	2	0	Tallow	75	10	0	0
Bones	14	11	0	0	Bones	10	14	3	0
Salt 13 ton					Salt 14 ton				
	283	3	0	0		284	19	3	0
<i>Cambria</i>, 233 ton.—From Uruguay.					Brigantine <i>Scotsman</i>, 185 ton register, measurement 100 × 22 × 12'9 feet.				
Hides	196	15	0	0	Hides	166	5	0	0
Tallow	118	15	0	0	Tallow	70	15	0	0
Bones & Horns .	19	0	0	0	Bones ...	21	2	2	0
Salt 10 ton					Salt 10 ton				
	334	10	0	0		258	2	2	0

at least eight or nine inches of level dunnage in the bottom, with two or three inches in the wings, and a single spread of hides nailed up and down against the skin of the ship, (the fleshy part towards the ship's side), to keep the dunnage in its place, and prevent loss of salt and pickle. These hides are brought into the cargo as the stowage progresses upwards. As salted hides are very heavy, more dunnage is required below to keep the cargo higher up. Some merchants recommend a layer of pipes of tallow from end to end; sometimes a layer in each wing also, if there is more than will fill the ends of the ship. The main object is to get a level bed for the hides. When stowing at Buenos Ayres, Monte Video, and Rio Grande, great care is taken to maintain an exact level with every layer. It is the universal practice to stow hides with the hairy side upwards; where it becomes necessary to turn in a part of a hide, the hairy part should be turned in carefully supplied with salt and pickle to prevent decomposition. Hides will quickly decompose if allowed to touch any article not of such a kindred character as bones, horns, &c., and will be burnt by turpentine, and stained by oak wood,

both of which, like iron, require to be well dunnaged with bones, &c. The masts, beams, and pump-casing should be well dunnaged. A ship of 300 tons will require about 20 tons of steamed bones for dunnage. Merchants prefer having the entire cargo stowed in one bulk; when there are more bulks, the risk of injury is increased by the waste of pickle from the ends of the bulks and the consequent decomposition of the outer hides; when more than one bulk is absolutely necessary, the space between should be well filled with salt, covered, so as to prevent leakage from coming in contact with it. Through the inconvenience of creeping about under the beams, the crew will sometimes double up the top hides; in this case the folds will be sure to rot and loss will fall on the ship.

515. The **pickle** should be made with fresh-water. Some masters consider that there is sufficient salt when a potatoe will float in it if stirred with a stick. It is preferable to put too much rather than too little salt. Pickle should not be made with salt-water, or the hides will turn black immediately afterwards, send forth a most disgusting effluvia, and then rot. Some merchants, however, while admitting that fresh-water is preferable, state that sea-water can be used if made into **VERY** strong pickle. They contend that more care must be taken against the use of weak pickle, which, all admit, is very injurious. As a matter of fact sea-water is used, especially at Monte Video. The pickle is usually placed near the hatchways in a large cask; it is lowered into the hold in buckets, and poured on the hides gently as if from a watering pot. There is considerable waste when a pump is used. It has been suggested that a flexible hose, having at the end a pliable tap and perforated nozzle, might save time and labour; this, however, could scarcely be done without the aid of a force-pump. It is the practice with ships which arrive with cargoes of salt to retain on board sufficient to pickle their cargoes of hides. Ships not bringing cargoes of salt, have it brought off in whale boats or small lighters (about 50 fanegas in each), the crews of which lay the salt on the ship's deck, first placing something under to keep it from the planks. Careful masters gather all the stray salt after loading, and throw it on the hides occasionally on the passage home; the dampness of the ship will soon convert it into pickle; this preserves and makes them turn out better on discharging. When the last part of a cargo has been stowed on the slope, and no pickle has been thrown on it during the passage home, considerable loss of freight has occurred in consequence of damage to the uppermost hides and to the outer edges of those next below. It is almost unnecessary to add that under no consideration should hides be

stowed in this way, but flat as elsewhere directed. Merchants recommend the fore and after hatches to be kept open in fine weather, on the passage home, to let off the steam from the hides. It is desirable for all interests that the cargo should be delivered in good condition. Close attention is usually paid at the commencement of the discharge, with regard both to the stowage and the pickling. Masters are sometimes persuaded to take in more salt for pickling than is necessary, under the pretence that the overplus will belong to the ship on arrival. Unless there is a stipulation to the contrary, no freight is payable on the salt, which belongs to the shipper or his agent at the port of discharge. On the discharge of a cargo of salt hides it is usual to calculate that there will be a loss in freight of 15 ¢ cent., that being about the proportion of the salt used in stowing. The loss of weight by drying and evaporation is calculated at from 3 to 6 ¢ cent. Masters have had to submit to large deductions through injury from the effluvia of decomposed hides; the freight has been sometimes absorbed altogether; in the case *MONTOYA v. LONDON ASSURANCE Co.*, the underwriters were held liable for injury thus caused to tobacco stowed over hides.

516. One firm, which has had great experience in the trade, adopts the following form of charter-party, which includes their instructions for stowing salted hides.

Charter-party. LONDON, It is this day mutually agreed between
of the good ship or vessel called the classed and coppered
of the burthen of tons, register measurement, or thereabouts, now
and HAYCROFT & PETHICK, Merchants. That the said ship being tight, staunch
and strong, and every way fitted for the voyage shall, with all convenient speed,
sail and proceed to and there load from the charterers' agent a full and
complete cargo of salt, in regular turn, and therewith proceed to Monte Video, for
orders, to be given within forty-eight hours after written notice of arrival, to
discharge there or at Buenos Ayres, or in the River Uruguay, not higher than
Paysandu, or in the River Parana, not higher than Rosario, and deliver the same,
on being paid freight at the rate of per ton delivered as customary. Should
the vessel be required to load the homeward cargo at any other port, sufficient
salt to be left on board for ballast. The days occupied in shifting ports not to
count as lay days, after which, the vessel to be made ready and load from the
charterers' agent a full and complete cargo of salted hides, (and or) tallow (and
or) other lawful produce; which the said merchants bind themselves to ship, not
exceeding what she can reasonably stow and carry over and above her tackle,
apparel, provisions, and furniture; and being so loaded, shall therewith proceed
to QUEENSTOWN or FALMOUTH, for orders, which are to be sent in course of post,
in reply to master's letter on arrival; to discharge at a SAFE PORT IN THE UNITED
KINGDOM or ON THE CONTINENT BETWEEN HAMBURG AND HAVRE, inclusive, or
so near thereunto as she may safely get, and deliver the homeward cargo, being paid
freight for tallow (and or) wet salted hides, at the rate of shillings if
loaded at MONTE VIDEO or BUENOS AYRES, shillings if loaded or discharged

on the rivers as above, per ton of 20 cwt. delivered and twenty shillings per ton for bones (and or) horns, for dunnage only, at master's option as to quantity.

The act of GOD, the Queen's enemies, fire and all and every other dangers and accidents of the seas, rivers, and navigation, of whatever nature and kind soever, during the said voyage, always excepted. Other goods (if shipped) to pay freight in full and fair proportion to salted hides. The cargoes to be brought to and taken from alongside at charterers' risk and expense.

Freight to be paid as follows:—sufficient cash for ship's disbursements at ports abroad, at current rate of exchange, subject to the usual charges for commission, insurance, and interest, till the freight is earned, and the balance of salt freight after delivery, by the master's draft on charterers, payable in London at ninety days' sight. For the homeward cargo, one-third in cash on the true and right delivery of said cargo, at final port of discharge, and the balance by good and approved bill on London at three months' date, or cash equal thereto, at merchant's option. The master to sign bills of lading as presented, without prejudice to this charter-party, and to afford in discharging and loading all practicable assistance by means of the ship's boats and crew, agreeable to custom of the port. The ship to be consigned to the charterers or their agent at all ports, paying commission at the discharging ports only, say $2\frac{1}{2}$ per cent. on each freight. The salt for stowage to be brought home free of freight. running days (Sundays excepted) to be allowed the said merchants (if the ship is not sooner dispatched) for unloading the salt and loading the homeward cargo. days on demurrage over and above the said laying days at pounds per day. The homeward cargo to be discharged with all possible dispatch.

Penalty for non-performance of this agreement,

Instructions. 1st. The ship to be well dunnaged with either horns or bones to the level of the keelson; the dunnage to be continued up the sides of the vessel, of the thickness of at least two horns or bones, taking care that in no case any hides touch the sides or skin of the ship.

2nd. If it be possible, let the whole length of the hold be stowed in one bulk, without any breaks, except those at the masts and pump cases, which parts, as well as the beams of the vessel, to be dunnaged as directed; should there be a necessity for the separation of bulks, the space between to be filled with salt and carefully covered over to prevent water from leaky decks, or otherwise, from getting down between the bulks.

3rd. The hides to be laid out perfectly flat and level, and each hide to be copiously supplied with both salt and strong pickle, and not to be doubled or folded, except when unavoidably necessary, for the keeping the bulk level, and at the fore and after ends of the ship, and when folded the folds to be well pickled and salted.

4th. The top of the cargo to be left perfectly level, so that salt and pickle may be applied to it during the passage home; the captain taking care to retain from 15 to 20 cwt. of salt for that purpose.

5th. During the passage home, the after and fore hatches to be kept off, when the weather will permit, and thus allow the steam of the cargo to escape. If these instructions are attended to, and the top of the cargo kept strewed with salt, there will be no damage.

517. Great difference exists in the weight of bones; fresh unstained shinbones (being solid) are very heavy. When bones

become old they lose much of their weight ; especially fine bones, such as ribs. Steaming diminishes weight ; shinbones not so much as others. Old steamed fine bones are very light and float on water. Bones are subject to loss of weight on the passage, and the discharge is always less than the in-take ; even dunnage bones used under salted hides, loose weight, notwithstanding there contact with salt. When bones form part of a cargo with bone-ash, it is desirable to place them in the ends. A bed or lining should be formed for the bone-ash. The freight for bone-ash is usually 12 per cent. less than for salt hides. 1,000 horns are usually taken as a ton, but they are frequently freighted by weight ; it will take nearly 2,000 to weigh a ton.

518. When a ship loads dry hides or wool, masters ought to provide themselves with dead-weight goods for ballast, generally salt hides, and rarely casks of tallow. For a ship of 300 tons, about 2,000 salted hides are required for ballast. A full cargo of tallow in casks gets 5 per cent. more than salted hides.

519. Capt. Y. FRENSTRA, an intelligent shipmaster, published at Amsterdam, in 1860 (C. F. STEMLER), a hand-book of the River Plate, chiefly in reference to the Continental trade, in which he says "merchants prefer shipping a large quantity of salted hides, rather than tallow should be taken for ballast. The space occupied by tallow is greater than the gain by weight. Usually when the freight of tallow is 50s., dunnage bones get 20s. My mode of stowing is this:—I first lay a row of casks on the ship's floor ; remainder in the wings and ends. The salt hides between. This is convenient, as it not only prevents water from coming to the hides, but the ship is easier at sea, because the heavy part of the cargo is higher in the hold. At **Buenos Ayres**, stevedores are usually paid 50 paper dollars per day ; generally there is a second at the same rate ; when a stevedore remains on board, he gets half-pay if there is no stowage, but full pay if there is work for only quarter of a day ; he is fed on board. A **Monte Video** I have paid a stevedore \$6 of 5 patacons (or about 20s.) per 1,000 dry hides. Two stevedores of the *Saladero St. Candida bij Concepcion del Uruguay*, I paid in 1855, as follows :—

1,000 salt cow hides	\$ 8 pesos plata.
1,000 dry ,,	7 ,,
Ton of bones	1 ,,
1,000 salt horse hides	7 ,,

And at Gualaquaychu, in 1855—

1,000 salt horse hides	\$ 4 pesos plata.
1,000 cow hides	8 ,,
1,000 dry cow hides	7 ,,
Ton of bones	1 ,,
113 bales hair (pressed)	7 ,,

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520. "When a ship is chartered for salt hides or other 'lawful merchandize' in proportion, with the necessary dunnage, the merchant is obliged, if he ships dry hides, to supply dunnage hides also ; but for those hides no freight is paid, such being the custom there. After the dunnage is laid, it is usual to place a layer of hides on it, with the hairy side uppermost, spread out like a bed-sheet ; two men lay each hide. Each pair keep their own side or place, so as to carry on the stowage equally. On each side of the hold there is a salter, who throws handsfull of salt on the spread hides. When they are laid and salted, the pickle is poured on. The last hides are laid like all the others with the hairy side up ; they are covered with a plentiful layer of salt ; this is especially necessary to prepare for deck leakage, as the salt would be converted into pickle. It is usually considered satisfactory when 600 ox-hides are stowed daily. With my crew and one stevedore I could load and stow 1,000 hides per day. Sometimes we could stow only 800 hides. Ships which carry 300 or 400 tons dead-weight, usually 700 or 800 per day ; larger ships could stow more."

521. **Dry hides** from the River Plate and Rio Grande are sent chiefly to Antwerp, Hamburg, and other continental ports ; a ship will usually carry about half her burthen of dry hides ; in reference to their stowage, Capt. FEENSTRA says, "when the salt hides for dead-weight are stowed, the dunnage hides are laid on them, the naked side downward. If the hold is ready, the double-folded hides are flanced over the ship ; they remain double-folded. When the hold is full to within three or four feet of the deck, the stowage is stopped. The screwing is done as follows : a layer of hides is placed each side until it reaches the deck, in order to get the proper stowage. A lot of old cask staves are then laid, to obtain a better entrance for the screwed hides ; they should be packed like a quire of paper one inside the other, about 20 or 30 in a lot. When the first lot is driven in, then follows another and so on, until no more space remains. Special attention is necessary when stevedores are employed by the day, that they do not screw too strongly, for the value of the time lost exceeds that of the freight gained. It sometimes happens that small ships are not broad enough for the length of two hides ; in that case, one or two ought to stow the smaller hides. The quantity which could be pressed daily, depends on circumstances ; sometimes on the industry of the labourers. It is usually calculated with a screw, from 400 to 500 hides.

522. "The freightage of dry hides depends upon the terms of the charter-party. If dunnage hides are agreed on, it is customary

to obtain dry horse hides, which are fastened at the upper corners with two nails. One layer is laid with the hairy side up, to cover the salt ballast hides; they are usually freight free. If, however, this is not stated in the charter-party, the merchant is not obliged to supply dry hides; horns or bones could be obtained to lay between, the same as those used for dunnage under salt hides. When a ship is chartered with a general cargo, and there is more than one shipper, it will be necessary for the master to lay planks or to purchase horse hides, which stow better and do not occupy so much space as horns or bones. Some ships take no dunnage for this purpose, but this is contrary to custom, and it is better to buy horse hides."

523. In stowing dry **California hides**, DANA says, the ballast is levelled off just above the keelson and dunnaged. When within four feet of the beams a pile is raised in the after part, close against the bulkheads, and crowded in by hand and by oar. Then a large book of 25 to 50 hides, doubled at the back, receives the sharpened ends of two long heavy spars, to which straps, tackles, and purchase-blocks are fitted, and all hands take the falls, and the book is well entered. The tackles are then nipped, straps and toggles clapped upon the falls, and two more luff tackles hooked on, and thus luff upon luff, where one hide could not be forced by hand, a hundred are often driven; although the beams may be started by the power used the cargo will loosen before rounding Cape Horn.

524. A Liverpool merchant of some experience says, that Rio Grande bone-ash being finer, can be used in the potteries; whereas that from the River Plate cannot; when one is valued at £6 5s. the other may be £4 10s.; sometimes it is damp; the evaporation on the voyage to England is usually 5 ¢ cent., occasionally 10 ¢ cent. He recommends that a cargo should consist of two-thirds bone-ash and one-third bones. The bones should be used for dunnage below, in the bilges and the ends, retaining enough to cover the ashes well. Nearly all the evaporation from the ashes will thus go into the bones, and rather increase their weight to the protection of the ship. Loading and unloading will also be greatly facilitated, when compared with the ordinary mode of stowing. The ashes being kept from immediate contact with the ceiling, sides, and deck, the risk of injury to them will be decreased. Some masters consider that by its extreme dryness bone-ash will draw the salt from the inner wood-work and encourage dry rot; others fear that bone-ash introduces worms into the ship's frame. Bones are frequently scarce at Rio Grande where horn piths are much used for dunnage.

525. On the shipment of **bone-ash, bones, &c.**, in the River

Plate, Capt. FEENSTRA says, "it is usual in chartering for bone-ash and bones, to take two-thirds weight of bone-ash against one-third bones. If the merchant supplies steam bones the proportion is advantageous; this applies chiefly to ships which have more space than they can load in weight. If instead of ordinary steam bones, steamed or dried ribs are supplied, they will be found to weigh very light, and as the merchant cannot claim more than twice the weight of bone-ash, the result will be disadvantageous. It does not often occur, but I have been so situated that the merchant has sent me lighters full of such ribs, which had scarcely any weight in them; it happened, however, that the merchant could not obtain more bones and was obliged to send bone-ash instead, so that I could load my ship as deep as I liked. To prevent such disagreements I should recommend masters when chartering to obtain the following conditions: 'The ship to be loaded with a full and complete cargo of bone-ash and bones. No more bones to be loaded than the master approves of'—[very doubtful.] Bones should if possible, be obtained with bone-ash, for bone-ash is very heavy, sometimes heavier than salt, and would cause the ship to be uneasy at sea.

526. "I once loaded bone-ash in the **Parana**, in the mouth of the Guleaguay, in which river the town of the same name lies. When we came to Monte Video the cargo was so dreadfully hot that we could not keep our hands in it a foot deep. I wish to prove by this that it was no bone-ash, although it has been usually agreed by the merchants there that it should go by that name. My crew were very uneasy as they feared it would ignite; I ordered them to throw fire on it, and as it did not ignite they became satisfied. A survey was held by a Dutch master and a shipper of bone-ash; they agreed that it was very hot, but not ignitable. What was I to do, to make a general average of it, and place the bone-ash in lighters to cool? that would have been most expensive, and being valueless it could contribute very little towards the average. I therefore determined to proceed, and as I had to pass the whole of the Brazilian coast, I obtained a certificate from two merchants, countersigned by the Netherlands Consul at Monte Video, as follows: 'We the undersigned, certify that in all our experience as shippers of bone-ash, we have never had a vessel in which fire has occurred, nor do we consider that it is an inflammable cargo, as prior to shipment it is burnt to such an extent that there is nothing left but phosphate of lime and a very small proportion of original matter, the truth of which is proved by the analysis daily received from England.' We afterwards found less heat, and in about four weeks it was gone

entirely ; on discharge the bone-ash was perfectly dry. During the passage, when the weather permitted, the fore-hatch and the after-hatch were opened by day to give as much ventilation as possible. After the discharge of the cargo we could not perceive that any injury had been done to the ship. Ashes and bone-ashes are subject to loss of weight.

527. "**Horns**, like shinbones, are used for dunnage ; 1,000 are rated against one ton of bones. Horns are preferable ; on a wharf 1,000 occupy more space than a ton of shinbones, but if properly stowed they take less space and are much lighter. With an entire cargo of salt hides, bones are preferable to horns ; but with dry hides (having salt hides for ballast) a master must be guided by his experience. Sometimes a vessel is fixed for 'salt hides—other lawful merchandise in proportion.' If the proportionate rates are not stated in the charter-party, disputes usually follow. HARRISON'S Freighter's Guide may be found useful. As pressed dry hides can be better stowed than unpressed, it is calculated at Buenos Ayres that dry should pay double as much as salt hides ; and the bales by measurement about 5s. or 10s. less than the ton weight of salt hides. Occasionally there is not more calculated for ballast, salt hides under dry, than 10s. or 15s. p ton to Continental ports. I was once chartered at 45s. p ton of salt hides, and received a large quantity of dry hides, unpressed hair, and horns, as cargo, to fill up for deficiency of hides. Being ordered to Antwerp, I made the freight account up with the broker according to HARRISON, which was not accepted by the receiver of the cargo, as being customary at Buenos Ayres, where, for dry hides, double the freight of salt hides is paid, and for the weight of unpressed hair 35s. We agreed as far as weight was concerned, for the salt hides ; but for the measurement goods there was a great difference between us. The horns, which were shipped as dunnage, I had received as cargo, and it was so stated in the bill of lading. Our accounts differed about £150. I held that by the River Plate proportion the whole was received as a general cargo to be calculated according to HARRISON ; the merchant disagreed but after a long delay he paid £100 over his calculation. No solicitors were employed ; and I made a much better freight than with salt hides alone."

528. In the **East Indies** hides should be engaged only from first-class firms, with a specification that they are well dried. Native shippers have sent them on board insufficiently cured, and several passenger ships suffered thereby from fever and sickness. At Calcutta the bales are about five or six feet long. They are shipped at all

seasons. At Melbourne, hides are salted, folded into a squarish parcel, and tied with yarn. Hides, &c., are prohibited to be landed in Baltimore, U.S., at certain periods.

529. Damaged Cargo. In the *Common Pleas*, 20th February, 1858. The *Ontario* loaded 300 bales Patna hides at Calcutta, but bad weather forced her back; she remained four months in the harbour; defendant PAGE, refused to accept the hides, alleging that they were deteriorated by salt-water, ravage by moth, &c. Verdict for plaintiff.

530. Average. In the cause *ROUX v. SALVADOR*, the subject matter of the insurance was hides, warranted free from "particular average," shipped on board the *Roxlaine*, at Valparaiso, for Bordeaux, and which, owing to stress of weather was obliged to put into Rio Janeiro. The jury found that they were so damaged by sea peril that they could not have arrived in the form of hides.

531. Proportionate Freight. A British vessel is chartered at Hamburg by a German house, to load at Buenos Ayres a cargo of hides, and to call at Cowes for orders; freight £4 sterling P ton (2,240 lbs.) for dry hides, and £2 10s. for wet, other goods in full and fair proportion, according to the custom of the port of lading. If the vessel is loaded with a full and complete cargo of dry hides, the freight for the necessary wet hides, required for ballast, to be reduced to 40s. The captain is bound to sign bills of lading, and re-charter at any rate of freight, without reference or prejudice to this charter-party. The ship, 200 tons burthen, is loaded with 20 tons of dry hides, and is filled up with bales and 60 tons wet hides. Charterer's agents re-charter her, and bills of lading are signed by the captain, as presented by them, at 40s. and 5 P cent. for bales and wet hides. The ship discharges her cargo at Antwerp. The consignees pay freight in accordance with bills of lading, and refer the captain to the original charterer for balance due as per charter-party. On application to the Hamburg house it refuses to pay the difference, and pleads "not indebted." The editor of the *Gazette* is asked: whether the owners are not clearly entitled to 50s. on the wet hides and 47s. 6d. on the bales? and is answered: the owners are entitled to 50s. on the wet hides, and that taking the proportion of freight as between wet hides and bales, for vessels on berth at Buenos Ayres, on the 31st October, 1857, the owners would be entitled to 57s. 1½d. on the bales, as compared with wet hides at 50s.

532. Upon this a correspondent says: I think you have been led into an error as to the meaning of the word "bales," as introduced by your querist, and that bales of wool or hair are really meant; and on reference to the rates at Buenos Ayres, they are quoted at exactly half the rates for dry hides, which in the present instance, would give only 40s. for the bales; he is told: the contract in the letter referred to was £4 per ton for dry, and 50s. for wet hides; other goods in proportion. She was loaded with 20 tons dry hides, and filled up with bales and 60 tons of wet hides; the bills of lading, signed without prejudice to charter-party, lumping the wet hides and bales at 40s.; under them, therefore, the 40s. is conclusive; but calculating on the full and fair proportion stipulated for, and taking wet hides at 35s. and bales at 40s. (the proportion 31st October, for vessels on berth at Buenos Ayres), the returns would give (taking wet hides at 50s. as covenanted for under the charter party) precisely the proportion stated. If the bales were wool or hair, which was not stated, and the calculation was made on the dry hides (instead of the wet) 40s. would be the proportion.

Tonnage. 17 tons salted hides occupy 852 cubic feet or 1 keel. Bengal and

Bombay ton 50 cubic feet screwed hides, &c., ; Madras, 14 cwt. ; Bombay, 12 cwt. loose and small bundles. Manillas go by weight. Australia, 20 cwt. ; Bahia, 12½ dry hides, 16 salted, 20 green ; New York, 10 cwt. dry ; Baltimore, 1,120 lbs.

Freight. Dried Baltic hides receive three-eighths more than freight of clean hemp per ton gross ; wet or salted two-thirds freight of clean hemp per ton gross. When wheat is 1s. ½ quarter freight, dried hides are rated at 13s. 4d. ½ ton. A dicker of hides consists of 10 skins, and a last of 20 dickers. In some places 12 dozen skins make a last.

PILOTAGE—RIVER PLATE.

	Point Indio to Buenos Ayres.	Buenos Ayres to Point Indio.	Meridian to English Bank.
Feet.	Dollars.	Dollars.	Dollars.
15	75	50	90
20	150	85	190

100 English feet=109 Burgos.

HARBOUR DUES—BUENOS AYRES.

Inwards, 12 reals copper per measured ton. *Outwards*, ditto. *Ballast*, 6 reals ½ ton.

	DOL.
REPORTING INWARDS—Custom-house	92
Visit \$6, register \$1, gratuity \$30	37
	—129
OUTWARDS—Seals for the opening of register for loading.....	80
Custom-house officers ..	50
Seals..... \$36 Captain of port \$20	56
	—186

HARBOUR DUES—MONTE VIDEO.

Say for a ship of 305 measurement tons, with cargo in and out, viz. :—

Bill of health in the Sound	C. dol.	4'640
Pilotage		10
Opening register for discharge		19'320
Buoy money, 2 real per ton (305 tons)		76'200
Opening register for loading		19'320
Guard, at \$1 ½ day, say 60 days		60
Notary, In and Out		16
Reporting and clearing, \$15. Pilot outwards, \$4		19
Bill of health, hospitals, flag-money, and boat expenses		19'380
Light dues, half silver real (60 centesimo) per ton		22'700

Noting protest 3s. 4d.

267'160

CUSTOM OF THE PORT OF RIO GRANDE DO SUL.

The proportional difference on Freight between WET SALTED HIDES and other produce shipped is as follows :—

TALLOW, in cases or casks	}	The rate as for Wet Salted Hides, but on gross weight delivered.
JERKED BEEF		
TALLOW or GREASE in pipes, $\frac{1}{2}$ -pipes, or $\frac{1}{4}$ -pipes (an entire cargo)	}	10 ¢ cent. more than for Wet Salted Hides, on gross weight delivered.
BONE-ASH		
STONES, loose or in barrels	}	12 ¢ cent. less than for Wet Salted Hides.

FOR WOOL IN BALES OR HIDES IN BAGS :

When the vessel is entirely loaded with these articles	}	100 ¢ cent. more than for Wet Salted Hides.
If loaded with three-fourths of the cargo ...		
If loaded with half ...	}	75 ¢ cent. ditto.
If loaded with one-fourth		
If loaded with seven-eighths	}	50 ¢ cent. ditto.
If loaded with less than seven-eighths		
	}	25 ditto.
	}	15 ditto.
	}	Same as for Salted Hides.

FOR DRY HIDES, HAIR IN BALES, OR HIDE CUTTINGS :

If loaded with these articles	}	50 ¢ cent. more than for Wet Salted Hides.
If loaded with three-fourths of the cargo ...		
If loaded with one-half ..	}	40 ditto.
If loaded with one-fourth		
	}	20 ditto.
	}	Same as for Salted Hides.

No lay-days shall count on clearing the vessel at the custom-house or on changing anchorage.

In case of ballast being required, the vessel has to find the same.

533. HOLD AND HULL.* As many parts of the hold and hull are necessarily referred to in this work, a short explanation of several of them is given below. The hold is the interior cavity of a ship, or all that part of her inside between the floor and the lower deck, throughout her whole length, prepared for the reception of cargo; in chartering for freight the hold extends from the steerage bulkhead to the forecastle bulkhead. The hull is the whole frame or body of a ship, exclusive of the masts, yards, sails, and rigging; that part below water is called the bottom. Some information at the conclusion of the article timber is equally applicable to hold and hull, and the article trim may be read with more advantage, after perusing the explanations which follow. The modes of measuring the hold will be found in the article tonnage.

* For definitions of nautical terms generally, and of technical expressions of every kind relating to maritime affairs, we refer our readers to the 2nd Edition of YOUNG'S Nautical Dictionary, which is illustrated with numerous wood-cuts and plates

Amidships. In midships or in the middle of the ship, either with regard to her length or breadth; that timber or frame which has the greatest breadth and capacity in the ship is denominated the *midship bend* or midship section.

Bilge. That curved part of a ship's floor which connects the horizontal with the perpendicular part of a ship's side, and on which the ship would rest if laid on the ground, or, more particularly, those projecting parts of the bottom which are opposite the heads of the floor-timbers amidships, on each side the keel. Others say the bilge means the quickest turn of the midship timbers; hence it is said, a vessel has a quick bilge or an easy one, meaning a quick or crooked timber at the first and second futtecks.

Bilge pumps are small pumps used for drawing off any water which may lodge about the bilges of the ship when she is lying so much to one side that the water does not reach the foot of the main pumps. Their proper place is in the middle.

Breast-hooks. Large pieces of compass timber or iron fixed within and athwart the bows of the ship, of which they are the principal security, and through which they are well bolted. There is generally one breast-hook between each deck, and three or four below the lower deck. Those below are fitted close to the shape of the ship, at their respective places. The breast hooks that receive the ends of the deck planks are also called deck-hooks, and are fayed close home to the timbers, in the direction of the decks. [Speaking of the projection forward of a cargo in bulk, by a ship plunging when under full canvas, it is usually said that she throws her cargo on the breast-hooks.]

Broken-backed or hogged. The condition of a ship when the sheer has departed from that regular and pleasing curve with which it was originally built. It is occasioned by lying on uneven ground or on shifting sand-banks, especially with ships weakly constructed or having great length and flatness of floor. The improper situation of the centre of gravity of the cargo will sometimes cause a ship to be hogged. [It has occurred frequently by the injudicious stowage of weights at the ends of a vessel—the midship part being partially empty. This applies particularly to passenger ships, where the bulk of the water and the wet provisions, &c., are stowed in and around the square of the main hatchway; these being consumed gradually will cause the ship to strain, and in some cases get out of shape. [See a case appended to the article guano and the article trim.]

Bulkheads are vertical partitions built up in different parts of a wooden ship generally temporarily, but in iron ships permanently constructed, and watertight to divide her into various compartments. See the articles grain, iron ships, &c.

Ceiling. The inside planks of a ship. [The condition of the ceiling is of the highest importance in regard to the preservation of cargo; see the articles bread and grain.]

Chain-bolts. Large bolts used to fasten the plates of the chains, or the plates themselves which are attached to the iron strops of the dead-eyes, for the purpose of securing the mast shrouds. Most vessels which have chains fitted in the place of chain-plates, have short plates at the end of their chains, which are bolted on the side. The chain-bolts are the bolts securing those plates. They have the same name when the plates reach to the dead-eyes.

Chain-plates. Thick iron plates bolted to the sides as described above, fitted to extend to the outer edge of the guard boards, where the dead-eyes are fixed.

Channels. Thick planks bolted through horizontally on the outside, varying from 10 inches to two feet in breadth ; the fore end abreast of the mast, the after end continued aft many feet dependant on the tautness of the spars. The channels having the dead-eyes on the extreme outer edges give the shrouds a greater spread and, therefore, more security to the masts. Leakage often occurs in the wake of the channels through heavy seas striking underneath, and from the severe strains on all the fastenings, caused by sharp and sudden jerks when a ship rolls heavily.

Clamps. Thick planks forming the uppermost strake of ceiling or planking inside the ship, used to sustain the ends of the beams ; they are placed close under each deck and fayed securely to the timbers, to which they are fastened with through bolts and treenails.

Counter. A part of the stern, the lower counter being that arched part immediately above the wing transom. Above the lower counter is the second counter, the upper part of which is the under part of the lights or windows. The counters are parted by their rails, as the lower counter springs from the tuck-rail, and is terminated on the upper part by the lower counter-rail. From the upper part of the latter springs the upper or second counter, its upper part terminating in the upper counter-rail, which is immediately under the lights. Some say the stern is that part immediately above the counter ; and some say the counter is that part of a merchant ship's stern, from the wing transom to the first turning or bend in the timber ; all above is called the upper stern. [Rats eat through certain angles of the counters, and create leakage ; see vermin.]

Dead-wood. Pieces of timber corresponding with and laid upon the keel, particularly at the extremities, forward and aft, where they run up to a considerable height against the stem and stern-post, so as to form an abutment for the heels of the timbers termed cants, which timbers take the place of floors when the angle becomes too acute for their continuance further forward or aft.

False keel. A second keel, composed of elm plank or thickstuff, fastened in a slight manner under the main keel, to prevent it from being rubbed. Its advantages also are, that if the ship should strike the ground the false keel will give way, and thus the main keel will be saved. It is also the means of causing the ship to hold a better wind, or to sail nearer to a wind.

Floor. The bottom of the ship, or all that part on each side the keel extending to the bilge ; thus it is said a sharp floor, a flat floor, a long floor, &c.

Floor timbers, those parts of a ship's timbers which are placed immediately across the keel, and which form the bottom of the ship ; to these the upper parts of the timbers are united, being a continuation of curved timbers upwards. [Masters should be well informed of the nature and strength of the floor timbers and futtocks, before loading heavy cargoes ; see iron.]

Foot waleing. Planking forming part of the ceiling but somewhat thicker than the rest, commonly termed limber strakes. It extends along the floors parallel to the keelson, at about 9 or 10 inches distance, and is through-bolted to secure the heels of the first foothooks.

Forecastle. A place forward under the deck, for the accommodation of the crew ; when under a short deck, above the upper deck, it is termed the top-gallant forecastle. [Some ships are damaged by tar, water, &c., wasted from the forecastle ; see master.]

Puttocks or Foothooks, separate pieces of timber of which the frame is composed. They are named according to their situation, that nearest the keel being called the first futtock, the next above the second futtock, the heel of which goes on the head of the floor, and the heel of the third on the head of the second, and so on. Another authority says, the middle division of a ship's timbers, or those parts which are situated between the floor and the top timbers; those next the keel are called ground futtocks, and the rest upper futtocks; see iron.

Half-deck. That portion of the sole continued forward from the cabin bulk-head, or aft from the fore-castle.

Hogging. A ship is said to hog when the middle part of her keel and bottom are so strained as to curve or arch upwards. This term is, therefore, opposed to sagging, which, applied in a similar manner, means, by a different sort of strain, to curve downward; see broken-backed. The form given to the bodies of ships is such that although the whole vertical pressure of the fluid is equal to the weight of the ship, yet the vertical pressure on every portion of the body is not equal to the superincumbent weights. [If cargo is removed from the middle of a ship and considerable weight is left at each end, she is liable, when water-borne, to be hogged; and, on the other hand, if a ship be deeply laden with heavy cargo amidships, she is liable when afloat to be sagged.] A ship when at rest is not equally water-borne in all parts, as when afloat the extremities are sustained partly by the water and partly by their connection with the central body.

Keel. The main and lowest timber of a ship, extending longitudinally from the stem to the stern-post; it is formed of several pieces which are scarfed together; it is the basis of the whole structure. It is, of course, the first thing laid down upon the blocks for the construction of the ship. [Some descriptions of heavy goods ought not to ride across the keel, or their whole weight will be thrown on it; see iron, mate, and ore.]

Keelson or Kelson. The timber forming the interior or counterpart of the keel, as it is laid upon the middle of the floor timbers, immediately over the keel, and, like it, is composed of several pieces scarfed together. [The scarfs are if possible, disposed clear of the main and fore masts, also the scarfs of the main keel, and likewise the main hatch, where the scarf may be injured by accident when lowering goods or heavy articles; see mate.

Knees are crooked pieces of iron or wood, having two branches or arms, and are generally used to connect the beams with the sides or timbers. [In America and the Baltic where crooked timber is scarce, knees are often formed of roots. Iron knees require to be well dunnaged off from perishable goods.]

Lazaretto is a part of the lower deck, parted off for the reception of provisions and stores; it is generally under the cabin in small ships. It is also the name of a hospital ship, or a ship for receiving quarantine goods.

Ledges. Oak or fir scantling used formerly in framing the decks, which are let into the carlings athwartships. The ledges for gratings are similar, but arch or round up agreeably to the head-ledges.

Limber-holes, openings between the floors next the keelson, formed by the heels of the first futtocks being cut off at the limber strake.

Limber-passages. A passage or channel throughout the whole length of the floor, on each side, for giving water a free communication to the pumps. It is formed by the limber strakes, which are on both sides of the keelson, formed from the

upper side of which the depth in the hold is always taken. This strake is kept at about 7 to 11 inches from the keelson, and forms the passage fore and aft which admits the water with a fair run over the floors to the pump-well. [The water should never be allowed to gain this height if it can possibly be prevented, for by the heeling of the ship it would soon damage cargo, especially in coasting vessels without dunnage.] The upper part of the limber-passage is formed by the *limber boards*, which are made to keep out all dirt and other obstructions. These boards are composed of short pieces of oak plank, one edge of which is fitted by a rabbit into the limber-strake, and the other edge bevelled with a descent upon the keelson. To prevent their being displaced, each should be marked with a number corresponding with one on the limber-strake. They are occasionally removed to clear the limbers of any filth, sand, chips, or gravel by which they may be clogged, so as to interrupt the passage of the water to the pump-well. [The clearance of the limber-passage is one the most important duties, especially with such cargoes as grain, guano, rice, sugar, &c.]

Magazine. The apartment used to lodge the powder in; in large ships it is situated forward, in small ships abaft; see ammunition, combustion (spontaneous), and gunpowder.

Orlop Deck in men of war is a deck below the lowest gun deck, and used for stowing cables, &c. In merchant vessels it is the deck below the between decks. This deck should not be strained by heavy cargoes such as timber, which see.

Palleting. A slight platform made above the bottom of the magazine, to keep the powder from moisture.

Partners. A frame work of short timber fitted to the hole in a deck, to receive the heel of a mast or pump, &c.

Pillars and Stanchions are square or turned pieces of wood or iron, fitted vertically under the beams of the decks to support them. [With perishable goods they should be well dunnaged, and with timber cargoes well protected.]

Raft port. A large square hole cut through the buttock between or under the transoms, or forward in the bow between the breast hooks: and through which masts, planks, deals, &c., are taken into store ships or merchant ships carrying such cargoes, which owing to their great length, could not be got on board in any other way; see mate and timber.

Sagged; see hogged.

Sampson post. A large pillar or stanchion, placed up on end with a rake, so that one end rests against a beam and the other on the deck. It is used as a point of resistance for hooking powerful tackle, or for jack screws when cargo is being screwed into a ship; see wool.

Scuppers. Lead or metal pipes let through the ship's side, to convey the water from the deck; see the article tea.

Scuttles. Square openings cut through the decks, much less than the hatchways, for handing small things up from deck to deck. There are also scuttles cut through the sides of the ship, for the admission of air and light into the cabins between decks, &c; see the article mate. To *scuttle* a ship is to make holes in her, so as to let in water.

Shelf pieces or Stringers are pieces of timber running fore and aft the whole length of the ship generally; on them the beams lodge; they are bolted through the sides, and the beams are bolted and dowelled to them.

Timbers. A name given generally to the pieces of timber which compose the frame of a ship, as floor, futtock, and top timbers, as also the stem or head timbers, and the stern timbers.

Topsides. A name given to all that part of a ship's side above the main wales. [They require to be wetted occasionally in hot climates.]

Wall-sided, applied to the side of a ship when the main breadth is continued very low down and very high up, that the sides appear straight and upright like a wall.

Water courses are grooves cut through the under side of the floor-timber, three to six inches from the side of the keel on each side, through which water may run towards the pumps, in the whole length of the floors. This precaution is requisite in merchant ships only, where small quantities of water, by the heeling of the ship, may come through the ceiling and damage the cargo. For cleaning out these holes the lower futtocks of some merchant ships are cut off short of the keel.

Waterways. Long pieces of timber, running fore and aft, on both sides, connecting the beam with the vessel's sides. The *scuppers* are cut through them to let the water off; see vermin.

Wings. Those parts of the hold and orlop deck nearest to the side, used generally to express any part of a ship or things nearest to the sides, as the starboard wing, port or larboard wing, starboard wing casks, &c.; see general cargo.

534. **HONEY.** Specific gravity 1.450. New York ton 20 cwt., gallons 12 lbs.; Havannah barrel 6 gallons. The barque *Iona*, of Pictou, Nova Scotia, loaded honey at **Nuevetas**, in Cuba, in May, 1864, for Bremen. She took in between 400 and 550 tons; it was packed in tierces containing 80 to 82 gallons, which were stowed in five tiers, and in barrels for broken stowage, 29, 30, and 36 gallons. Freight payable at per ton of 240 gallons. She had also 37,000 superficial feet of cedar wood—about 47 tons of 50 cubic feet each; and 410 bales of bast, 100 lbs. each, at 1,110 or 1,200 lbs. $\frac{1}{2}$ ton freight. So laden she drew 13 feet 9 inches aft, and 13 feet forward; with 660 tons of Pictou coal, her draft was 14 feet 6 inches aft, and 14 feet forward. She is 302.4 tons register under decks, poop 65.7 tons—total 367.7 tons; length 129 feet, breadth 29 feet, depth of hold 12.7 feet. When unloading it was found that considerable quantities of honey had leaked out of the tierces. Three or four vessels are chartered annually with honey from Cuba chiefly for the continent; the **season for shipment** is the same as for sugar—from January to May.

535. **HOOFS**, horn shavings, tips, all kinds, Bengal and Madras ton 20 cwt., Bombay 16 cwt.

536. **HOOPS.** For Admiralty quantities to a ton see the tonnage tables at the commencement of this work.

537. HOPS will damage by damp, and should not be stowed near any description of goods likely to heat ; they will also damage by exposure to the air, and cannot be too closely confined in a ship's hold. In **Australia**, the ton for freight is 40 cubic feet. A pocket of hops of good quality, well cured and tightly trodden, will weigh about $1\frac{1}{2}$ cwt., and a bag about $2\frac{1}{2}$ cwt.

538. HORNS should not be stowed too near casks, cases, &c., so that their points may work through, which has occurred. Cow or buffalo, loose, Bengal and Madras ton 20 cwt., Bombay 16 cwt. Deer, loose, Bengal ton 20 cwt., Madras 16 cwt., Bombay 8 cwt. At Bahia, 10 cwt. hoofs and three mil of horns. At Rio Grande and Buenos Ayres, 2 mil of horns. In the article hides there is some information about horns.

539. HORSES conveyed on deck are placed in stalls, say 8 feet long, $3\frac{1}{2}$ to 4 broad, and 5 to 6 high, rising at one end to $7\frac{1}{2}$ or 8 feet, to give space for the head and neck. The stalls should be 4 inches clear from the deck, to allow the drainage to run off, and permit water from the pump-hose to flow freely underneath. Loose slings are always slung ready to receive the animal when cast down suddenly at sea ; and, to prevent surging too far forward, a strong moveable bar, well padded, is fitted across the stall to receive the chest ; about the height of the rib's padding (12 in. wide, 3 thick) is fitted all round inside. The door of the stall should be covered with coir mats, fastened with cross battens, which will assist the footing. Batten each side the floor for cattle, which lie down occasionally. When double stalls are used, the division need only rise 4 feet, so as to promote ventilation which is highly necessary. Horses should be prepared for a sea passage by previous occupation of an open shed ; when removed direct from a close stable to a ship's deck, their health is greatly endangered. At sea, constant grooming is necessary to keep them in good condition. The Army Regulations for the conveyance of horses, will be found under the general heading passengers.

540. On board government sailing transports, horses are berthed in the hold, on shingle ballast, in separate stalls, their heads towards each other amidships, where there is as large an avenue as can be obtained for light and ventilation. Two or three spare stalls are kept for convenience, when cleansing those in use. Arrangements are made for sustaining the horses occasionally on bands fixed to the deck above. Great care should be observed to prevent fire, which in December, 1854, totally consumed the barque *Europa*, with horses for the Crimea, in the Bay of Biscay. The quantity of forage, &c.,

required for government horses, will be found under the heading passengers ; see also cattle. Horses and cattle placed in the after part of the hold of a ship suffer most when she is going before the wind, because all the internal effluvia of the hold is driven aft. When she is on a wind the scent runs from the stern to the stem, and rises forward. This operates injuriously on board ship in reference to many other things besides horses and cattle ; sometimes the health of the crew is affected by the cargo ; see *Abbot's Reading*, in the article saltpetre.

541. HORSE HAIR, Baltic manufactured, receives double freight of clean hemp per ton of 44 poods gross ; manes one-fourth more ; tails same freight as clean hemp per ton of 44 poods gross. Some information about hair will be found in the article hides.

542. ICE, at **Boston**, U.S., is sawn into square blocks not less than 12 inches thick. The holds have a space between the planking of the ship and the ice, boxed in and filled usually with sawdust, or some other substance reckoned a non-conductor of heat. Bulkheads and hatches are closed as tightly as possible, to prevent the admission of heated air, which will diminish the cargo and endanger the safety of the ship. The galiot *Phoenix*, Capt. HENDRICKSTEN, loaded a cargo of ice at **Lengner**, Norway, in March, 1865. It was in blocks 10, 12, and 18 inches thick, and was brought in carts from a lake two miles distant, and stowed on wood dunnage 12 inches thick. She admeasures 74 lasts, is 76½ feet long, 18½ broad, and 11½ deep, Norwegian measure, and was loaded in seven working days. With the exception of four feet forward, the hold was full, and she then drew 13½ feet aft. On arriving at Plymouth in April, she had to wait for orders, and the weather being warm, some of the ice melted, especially when fog prevailed ; the pumps were used occasionally. Out-put 208 tons ; the master expected it would have been 225 tons ; first cost 17s., freight 14s., to discharge 30 tons per day. The Norwegian barque *Achilles*, Capt. SCHLYTTER, 386 tons register English, took in a cargo of ice at **Krogore**, in February, 1865, estimated by her draught, 14 feet fore and aft, to be 412 tons of 20 cwt. She is 92½ feet long, breadth under the beams 23 feet, and under the lower beams 22 feet ; depth of hold 13½ feet, all Norwegian feet. Dunnage in the bottom only, wood four inches deep. The blocks of ice were stowed close together. There was a space of two feet between the deck and the surface of the cargo ; the ends of the ship were not quite full. The ice is taken from the Fregensporg lake half a mile from the wharf, to which it is driven or slid on an open wooden trunkway. Nine days were occupied in loading ; six would have

sufficed, but two other ships were loading at the same time. At Krogore the **port charges** are light ; there is very little foreign trade and that chiefly with the Dutch and French. The *Achilles* discharged at Plymouth in March and April, and made out 406 tons.

543. At **Kodiach** (near Sitka) one of the Aleutian Indian Islands in the possession of Russia, as a fur station, ice is taken out of an artificial lake less than a quarter of a mile from the place of loading—a small pier, where the ship is moored. Large blocks are drawn along by iron hooks over planks fitted with iron rails running to the ship's hatchways, down which the blocks are lowered on an inclined plank, in the hold. Dunnage consists of cuttings from the dwarf pine tree, which grows freely on the island. Considerable quantities of the branches, thickly covered with their cool foliage, are placed between the blocks and on each layer as the stowage proceeds ; a profuse supply is laid over all. A vessel cannot carry herself full of this ice. The British ship *Carutyne*, of 1,000 tons, chartered by a Russian-American Company at San Francisco, loaded there in 1859 ; the time occupied in discharging ballast and loading ice was about three weeks. She landed her cargo at a wharf in San Francisco belonging to the Company, on which there is a house built for the reception of the ice.

544. **IGNITION.** But little danger is likely to arise from the ignition of commonly known inflammable substances, as precautions are generally employed ; but safety may be further insured by adopting as a rule, easy of application, that whenever it be necessary to take a light into the hold amongst inflammable bodies, that of course it should be in a lantern and preferably an oil lamp, but that it should always be accompanied with a wet bag or cloth, which by prompt and judicious use may be made the certain means of instantaneously extinguishing any fire produced by accident to the light.

545. But certain substances well known themselves to be inflammable, are not so well known to give off invisible gases or vapours which are capable of being ignited by contact with flame at a considerable distance from the bodies themselves. Such are some sorts of coal (noticed elsewhere), spirits of wine, brandies, rum, gin, whiskey, æthers, chloroform, and all distilled alcoholic fluids, as well as pyroxilic spirit or wood naphtha, benzole or coal naphtha, and camphine, or turpentine. Numerous and most serious accidents have arisen from the ignition of the vapour of spirits when being drawn off for ship's use. In case of breakage of a package containing any of these fluids, the vapour should be gotten rid of by active ventilation, and on no account whatever should it be approached

with any other light than a collier's or other safety lamp. The continuous emanation of vapour from spirits may be prevented by mixture with water. For coal and other bodies liable to the evolution of inflammable vapours, the prevention of danger may be best secured by attention to ventilation, which see; also camphine, dangerous goods, tars, turpentine, &c.

546. **INDIGO.** Dunnage 9 inches, sides 2½. The chests are of teak or other hard Indian wood, lined with thin oil cloth; they should be closely inspected before shipment to see that they are tight, for it happens occasionally that they are not tight enough to prevent the escape of fine dust, which is very liable to discolour and greatly injure rice, sugar, &c. Being light freight (specific gravity 1.009), indigo is often placed on the top, and sometimes has to be moved frequently from one part of the hold to another, before final stowage. Cargo should be previously covered with double or treble mats or losse dry hides, to receive the waste of the chests; and on discharging, the coverings should be taken off carefully to prevent the dust from falling among other goods. Some masters contend that indigo will shake through mats. With three thicknesses of mats under, indigo may be stowed on sugar, saltpetre, casks, &c. Indigo and other valuable freight shipped in the East Indies, should, if possible, be stowed beneath two decks. The chief **season for shipment** there is during the north-east monsoons. In the five years ending 1855, the average quantity of indigo imported annually was 27,342 chests of East Indian, weighing from 2 to 3 cwt. each; and 3,151 serons Spanish, weighing about 250 lbs. each.

Tonnage, &c. E.I. Co.'s and Manilla ton 50 cubic feet; weight 15 to 16 cwt. It used to be packed in chests nearly uniform, viz.: 18 × 24 × 36 inches, so that when covered with gunny, five measured about 50 feet, and were taken as a ton. 3½ maunds weigh 260 lbs., a chest 260 lbs. At Guatemala seron 250 lbs.

547. **INSURANCE.** Sea insurance means any insurance or re-insurance upon any vessel, machinery, tackle, furniture of the same, or upon any goods, merchandise, or property of any description whatever on board any vessel, or upon any freight or any other interest which may be lawfully insured in or relating to any vessel. And the word policy means any instrument whereby a contract or agreement for any sea insurance is made or entered into. Policy must be stamped, and cannot be made for more than twelve months.

548. Insurance effected against all or any of the following cases, and occurring without fault or privity of the owner of any ship, shall not be invalid by reason of the nature of the risk.

1. When loss of life or personal injury occurs to any person in such ship.
2. When loss or damage occurs to goods or merchandise in such ship.
3. When loss of life or personal injury is, by reason of the improper navigation of such ship, caused to any person carried in such ship or boat.
4. When loss or damage to goods or merchandise is caused by the improper navigation, as in clause 3.

Passage money is insurable.

549. VALUED POLICIES cover ship or goods valued at a fixed amount, or ship at certain sum, and machinery at another, and equipment at a third, or, it may describe the *pro rata* value of different interests.

550. AN OPEN POLICY leaves the valuation to be determined. It may be agreed to take out insurance for certain goods, or the shipments may not be expressed. Value may afterwards be agreed upon or rated.

551. RUNNING POLICIES attach to the property insured on board a ship or ships for a term ; see floating policies.

552. VOYAGE POLICIES are for a voyage to one or several ports. or for out and home. When a ship is insured to any country, unless "ports and places" in such country be named, the policy would terminate on arrival at the first port.

553. TIME POLICY. This fixes the period of the risk from one day and hour to that of others.

554. SPECIAL OR NAMED POLICY is in which the name of the vessel is entered.

555. FLOATING POLICIES are of two sorts—the one attaching to goods on board ship or ships, and the other insuring any ship or ships of certain lines sailing at or about given dates.

A deviation on the voyage, not caused by the perils of the sea, would vitiate the insurance, if not provided for in the policy.

556. IRON, BAR AND RAILWAY. In consequence of the number of iron-laden ships which have been lost or damaged, there is sometimes a prejudice against cargoes of this description, but where bar or railway iron is proportionate to the ship, and it is judiciously distributed in the hold, well stowed, and firmly secured, a master might confidently proceed with her to any part of the world. Indeed, an experienced master, whose suggestions are adopted, would prefer such iron to many other descriptions of cargo, especially where there is *no unnecessary expedition in loading*, and the capabilities of the

ship at sea, with her sailing qualities, meet with proper consideration. Masters should avoid overloading, have the quantity specified on the charter-party, and not exceed it. The correct principle of stowing any cargo whatever, should be to distribute the weight fairly over the ship's hold, so that no part of her frame be overloaded; and as regards the ship's trim and power of carrying sail, the centre of gravity of the cargo should not be too low nor too high. Now iron or other metals are generally too low in the hold, making the ship so stiff as to cause her to labour and strain greatly in bad weather. Very long bars should, if possible be avoided, especially if the vessel is short, and the hatchways small. Capacious hatchways save much time both in loading and unloading: Two days, or three at the outside, are considered sufficient to load a vessel of 140 tons burthen with iron. It is impossible to give specific instructions for stowing iron; the character of the ship, her size, the nature of the voyage, and the season of the year, have all to be considered, also whether it is a complete or partial cargo. In the latter case the condensity or the lightness of the other cargo should have a powerful influence as to whether the iron should be stowed solid or open.

One master says "protect the ceiling from chafe by putting three rows, with their ends shifted, between it and the bars, then lay fagots or wooden slabs with three or four ton of iron on them, and so on."

Another says "bar iron should be stowed diagonally (grating-fashion), bringing it up pyramidically from the ends; this is the mode at Newport and Cardiff. At Porthcawl they stow iron light some way, say one-third up the cargo, then solid, say one-fourth, and the remainder light; this mode has been found very advantageous."

A third says "place say one fourth of the iron below in open order, well secured; one-half compact, fairly distributed; the remaining one-quarter in open order. The centre of gravity will then not be too low."

An experienced stevedore recommends fagots about eighteen inches thick, to be laid athwartships, from the keelson to the sides. Iron fore and aft, solid or close together. Next tier angle-fashion, towards the keelson and the wings, pigeon-coted. Third tier crossed the opposite way, to form a diamond in the openings. Then fore and aft solid, and so continue two tiers open and one solid, until three-fifths of the cargo is in—finishing with a solid tier. On this dunnage with a layer of fagots, as before. Then one tier solid to two open, until the cargo is complete.

An experienced master who has loaded iron at Newport for Leghorn says, "it is of the greatest importance that the ground

tier should be carefully laid with a uniform level bearing throughout the length of the bars. The first tier should be stowed as closely as possible. The keelson should have a full share of the weight."

557. Stevedores occasionally endeavour to persuade masters to allow them to stow railway bars, &c., solid each side of the keelson, pretending that it will enable the ship to sail better. Their real object is to place a large proportion of the cargo on the ceiling, because it is easier for them, and it leaves more space in the hold to manœuvre the remainder of the bars, particularly if long, and when the hold is half full. Some shippers contend that the cargo should be so knitted together that a movement of the bars at one end of the cargo should be felt at the other end.

558. The Western Mercantile Insurance Association (Padstow), place the following restrictions as to cargoes of iron:—All ships except British A1, and those employed in the coasting trade, loading iron shall not exceed the following per centage, viz.: 100 to 200 tons, 35 $\frac{1}{2}$ cent. over registered tonnage; 200 to 250 tons, 30 $\frac{1}{2}$ cent.; 250 to 300 tons, 27 $\frac{1}{2}$ $\frac{1}{2}$ cent.; 300 to 400 tons, 25 $\frac{1}{2}$ cent.; 400 to 600 tons, 20 $\frac{1}{2}$ cent.; 600 to 800 tons, 15 $\frac{1}{2}$ cent.; 800 to 1,000 tons, 12 $\frac{1}{2}$ $\frac{1}{2}$ cent.; 1,000 to 1,200 tons, 10 $\frac{1}{2}$ cent.; 1,200 to 1,400 tons, 7 $\frac{1}{2}$ $\frac{1}{2}$ cent.; 1,500 tons, 5 $\frac{1}{2}$ cent.; pig iron and lead, two-thirds register tonnage.

DETAILS OF TWO CARGOES OF WELSH RAILWAY IRON.

SCHOONER.	TONS.	DIMENSIONS.	CARGO.	DRAFT.	
		Feet.	Tons.	Aft.	Forward.
QUEEN	96	65 × 18'1" × 11'5"	160	13 ft. 3 in.	10 ft. 3 in.
LEADER	159	97 × 22 × 12	255	12 ft. 9 in.	11 ft. 9 in.

559. The *Queen*, Capt. CHRISTY, was loaded at **Cardiff** in July, 1863. The only dunnage used was on the skin, in the ends of the ship, to protect them from chafe. The bars were about 18 feet long. The first tier was laid fore and aft on the flat of the floor, close together, from the keelson to the bilges, say 20 bars each side, and was subsequently continued up the sides as the cargo rose. The next tier was laid grating-fashion, say 8 of these to 20 of those laid solid. When eight tiers were crossed, the height of the keelson was reached, and the bars were then crossed on the keelson and the lower tiers. In this manner the bars were continued up to nearly within four feet of the deck beams. The cargo was then "blocked off" by placing

across it two 2½-inch planks about 15 feet apart. The rails (18 feet) were then laid fore and aft close together, with the ends shifted in pairs and extending in and out 18 to 24 inches. The ends were then securely lashed with small chain to the main part of the cargo, which extended to within five feet fore and aft of the bulkheads. So laden she behaved well at sea. With 160 tons of Landshipping coal her draught is the same as when laden with railway iron.

560. The *Leader*, Capt. TRENAMAN, loaded at **Newport**, in October, 1865. Her first tier of bars was also laid close on the skin, each side of the keelson, and carried up to the bilges, &c. They were crossed each side very light, say six or seven tiers, until the height of the keelson was reached; on it some wood was used to make it level with the tiers. The tiers were then crossed light say 2½ feet apart, until they reached within four feet of her hold beams, when they were stowed heavier, say one foot apart, until the beams were reached. [By having the iron stowed heavier at the centre of gravity, it made the ship more easy at sea, and in discharging there was less hoist for the principal part of the cargo.] Short bars were used to angle between the beams (which are about 20 feet apart) and were carried up to about an inch or so above the beams, which were kept free from the cargo. Then two planks were laid 18 feet apart, with their ends touching the sides of the ship. On the planks three tiers of bars solid, the upper tiers shifted three bars forward and three aft for lashing with 15 to 20 fathoms of ¾-inch chain, frapped with rope, which was wetted with a bucket of water or a mop, to tighten the fastening. With 260 tons NEVILLE's hand-picked Llanely coal the *Leader* draws 12 feet 10 inches aft and 11 feet 7 inches forward.

561. Both cargoes were for London. Had they been going a greater distance it would have been necessary to shore the upper part against the deck, in which case the shores should be well cleated above and below. The *Queen* was loaded aground, where it would have been useless to shore her, as she would drop perhaps two inches when floated. Cargoes going foreign are usually laden afloat. When the cargo requires to be placed above the beams it should not rest on them; but if unavoidable the beams must be shored. It is not advisable to lash the cargo to the beams for security against shifting. In reference to blocking off it may be stated that some stevedores reserve a number of bars just the width of the ship, and in such cases as those of the *Queen* and *Leader*, these shorter bars are laid across the cargo close together, to the extent of say half the length of the long bars (laid solid), and are lashed down with them. [Some masters consider that this arrangement is likely to create a deviation

of the compass to the extent of a quarter point or half point, according to the amount of magnetism in the iron ; see the article magnetism.] It is indispensable that when stowing as in the two cases above referred to, the stevedores should be watched closely, early and late, otherwise they will not sufficiently protect the skin of the ship with the bars laid solid, and will not place the ends of the crossed bars close against the protecting bars on the sides. Where this is not attended to and heavy weather is experienced, the crossed bars are liable to run against the sides of the ship and endanger her safety.

562. **Cargo shifted.** In 1854, the schooner *Pearl*, left Bristol with railway iron for Alicante ; her beam was narrow, the cargo shifted and she put back. When re-stowing the last five or six tiers, the master crossed the rails, burton-fashion, from side to side, with 24-inch deals, one at each end of the rails ; the deals were not placed directly over each other ; by this means the upper part of the cargo was securely bound together, as iron will not slide on wood like it will on iron.

563. A schooner left Cardiff on the 5th of March, 1865, for Lisbon, and on the 15th foundered in the Bay of Biscay. She registered 89 tons, was 72 feet long, 19.4 broad, and 10.4 deep. Her cargo consisted of 123 tons of railway and rod iron, and 21 tons of coke. The railway iron, 6,835 bars, of small size, 17 or 18 feet long, was stacked diamond-fashion and levelled on the top ; it extended four feet before the foremast, and was within five feet of the after bulkhead. The bars did not reach the beams by about two feet, and a man could walk over them. The rod iron, about 13 feet long, packed in 310 bundles of 1½ cwt. each, was placed in the wings "out of the way of the wet from the hatchways." The coke was thrown in last, and when at sea, it seemed to drop between the bars and made the cargo yet more heavy below, and at the same time decreased the elasticity of the iron, greatly to the disadvantage of the sailing of the ship. So much weight below and in the wings made her roll in heavy weather ; she sprung a leak, and the crew were obliged to take refuge in a passing vessel, which brought them safely home.

564. A ship of 850 tons register, bound to the East Indies, was stowed in London as follows : the first tier of railway iron was laid solid, fore and aft, about two-thirds of the distance from the keelson towards the bilges ; the second and third tiers grating-fashion ; the fourth solid, and so on, until the height of the keelson was reached. The wings were then filled with wood railway sleepers up above the keelson. The first four subsequent tiers were laid open, the fifth

solid, keeping the wings filled up with sleepers as the iron rose. In this manner the ship took in 900 to 1,000 tons of iron, which reached to about four feet before the foremast, as far aft as the mizen mast, both ends and the wings being filled up with sleepers. The remainder of the cargo consisted of general goods over all. So laden she behaved well at sea and made a successful voyage. This method of stowage keeps over-weight off from the bilges and brings the iron to a proper height. Railway sleepers are very suitable in the same hold with railway bars.

565. Railway bars for the **East Indies** are mostly oiled, which greatly increases the danger of shifting; loose straw or sawdust is sometimes used in stowing the last part of such a cargo, to decrease this risk. In charter-parties for "railway iron," iron chairs and fish-plates are occasionally included with bars. The quantity of chairs and plates should be proportionate to the bars. For use, four fish-plates are required to each bar for securing it to the sleepers, and in this proportion there is not much danger at sea, especially if placed at the ends. It happens, however, at times, that as much as 100 tons of fish-plates are sent say with 150 tons bars; and a schooner so laden at a Welsh port foundered in the Bristol Channel. The fish-plates were placed on the bars. Occasionally bars of round iron are sent on board to be stowed with railway bars or bars of flat iron. Although stowed at a considerable depth in a cargo, when heavy weather is encountered, all the upper part has been known to roll on the round bars, and to endanger the safety of the ship; it may be better in this case to place the round bars in the ends. Small rod iron was formerly tied at each end in portable bundles; when loose they are liable to roll about in the ship's hold. In chartering for old engines, machinery, &c., the character of the articles offered should be known so as to ascertain whether the freight should be by weight or measurement.

566. **Swedish bar iron** is occasionally shipped to Hull in large parcels, sometimes in entire cargoes; to London it is shipped in parcels from 30 to 50 tons, rarely as much as 100 tons, and most frequently as ballast for wood and grain; freight is usually at a ballast rate, say cargo 20s., iron 5s. to 10s. Small parcels are placed below: for greater a sort of well is often built up with deals, sometimes the whole length of the hold; the iron is placed there, the loading being completed with deals. This raises the weight more towards the centre, and is intended to make the ship work easily at sea. The principal point with importers is that masters should use sufficient dunnage, so that the bars shall not come direct on the

skin, where they are rather prone to place it. Rust is the great liability to be avoided as it greatly deteriorates the market value of Swedish iron. Quantities of Swedish keg steel come as ballast with cargoes of oats, in which case they are usually spread out equally over the bottom of the hold. A Hull merchant says—"the usual way of stowing full cargoes of iron is to dunnage the bottom well, then put a deal upon its edge up and down the ceiling, and pigeon-cot the cargo as far fore and aft as will bring it within about 18 inches of the combings."

567. To save extra pressure in the bilges, one experienced owner recommends iron to be kept as much as possible fore and aft on the flat of the floor, and that when chequering, the chequers, should be closer over the keelson and amidships than towards the sides. When stowed close in the bilges, and the ship heaves over, the pressure must be excessive. The keels and keelsons of iron-laden ships have been sometimes injured when they have taken the ground, in consequence of all the weight being placed on the frame and none on the keelson. Care should therefore be observed to lay the bottom iron as high only as the top of the keelson, so that the first 'thwartship tier should have a bearing on it; the keelson would thus sustain a fair proportion of the weight of the cargo.

WEIGHT OF WROUGHT IRON BARS, 12 inches long, in Pounds avoirdupois.

INCH.	ROUND.	SQUARE.	INCH.	ROUND.	SQUARE.
$\frac{1}{8}$	.166	.211	$2\frac{1}{8}$	16.59	21.13
$\frac{1}{4}$	.373	.475	$2\frac{1}{4}$	18.30	23.29
$\frac{3}{8}$	.604	.845	$2\frac{3}{8}$	20.08	25.56
$\frac{1}{2}$	1.04	1.32	$2\frac{1}{2}$	21.94	27.94
$\frac{5}{8}$	1.50	1.90	3	23.96	30.42
$\frac{3}{4}$	2.03	2.59	$3\frac{1}{4}$	28.04	35.70
1	2.65	3.38	$3\frac{1}{2}$	32.52	41.41
$1\frac{1}{8}$	3.36	4.28	$3\frac{3}{4}$	37.34	47.53
$1\frac{1}{4}$	4.15	5.28	4	42.48	54.08
$1\frac{3}{8}$	5.02	6.39	$4\frac{1}{4}$	47.96	61.05
$1\frac{1}{2}$	5.99	7.60	$4\frac{1}{2}$	53.77	68.45
$1\frac{3}{4}$	7.10	8.92	$4\frac{3}{4}$	59.91	76.27
$1\frac{7}{8}$	8.13	10.35	5	66.38	84.51
2	9.33	11.88	$5\frac{1}{4}$	73.18	93.17
$2\frac{1}{8}$	10.62	13.52	$5\frac{1}{2}$	80.32	102.25
$2\frac{1}{4}$	11.99	15.26	$5\frac{3}{4}$	87.78	111.76
$2\frac{3}{8}$	13.44	17.11	6	95.58	121.69
$2\frac{1}{2}$	14.98	19.07	7	130.10	165.63

Weight of a copper rod 12 inches long and 1 inch diameter=3.039 lbs. Weight of a brass rod 12 inches long and 1 inch diameter=2.86 lbs.

**WEIGHT OF FLAT BAR IRON, 12 inches long, in Pounds
avoirdupois.**

Thickness.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1-inch.
Breadth in Inches.	$\frac{1}{8}$	'21	'31	'42	'63	...	...	...
	$\frac{1}{4}$	'32	'48	'63	'95	1'27	1'58	...
	1	'42	'63	'84	1'26	1'69	2'11	2'53
	1 $\frac{1}{4}$	'52	'79	1'05	1'58	2'11	2'64	3'16
	1 $\frac{1}{2}$	'61	'87	1'16	1'74	2'32	2'90	3'48
	1 $\frac{3}{4}$	'63	'95	1'27	1'90	2'53	3'17	3'80
	1 $\frac{7}{8}$	'74	1'11	1'48	2'21	2'95	3'70	4'43
	2	'84	1'27	1'69	2'53	3'38	4'22	5'07
	2 $\frac{1}{4}$	'95	1'42	1'90	2'85	3'80	4'75	5'70
	2 $\frac{1}{2}$	1'06	1'58	2'11	3'17	4'22	5'28	6'33
	2 $\frac{3}{4}$	1'16	1'74	2'32	3'49	4'64	5'81	6'97
	3	1'27	1'90	2'53	3'80	5'07	6'34	7'60
	3 $\frac{1}{4}$	1'37	2'06	2'74	4'12	5'49	6'86	8'24
	3 $\frac{1}{2}$	1'48	2'22	2'95	4'43	5'91	7'39	8'87
	3 $\frac{3}{4}$	1'58	2'38	3'17	4'75	6'34	7'92	9'51
	4	1'69	2'53	3'38	5'07	6'76	8'45	10'14
	4 $\frac{1}{4}$	1'90	2'85	3'80	5'70	7'60	9'50	11'41
	4 $\frac{1}{2}$	2'11	3'17	4'22	6'34	8'45	10'56	12'67
	5	2'53	3'80	5'07	7'69	10'14	12'67	15'21
	6							

Weight of a copper rod 12 inches long and 1 inch diameter=3'039 lbs. Weight of
a brass rod 12 inches and 1 inch diameter=2'86 lbs.

568. With iron cargoes, some ships are liable to leak in the bilges, especially when the bilge timbers are short and the joints frequent. The precise points of leakage are not always observable after the cargo is discharged, because the whole frame of the hull may have resumed its original position, and the outer planks will close again, like the staves of a ground tier cask after the upper pressure is removed. With too much weight in the ship's bottom, the upper works are generally liable to great strain, and every thing above becomes very tight. In some parts of America and Norway, oak and other crooked timber cannot be obtained, and the ship's floors and futtocks are made of straight fir, grain cut. The lower part of the outer butts of the floor timbers and the outer part of the lower butts of the first futtocks are rounded off to form the ship's bilge. In order to fasten the two thin ends together, triangular chocks are fitted inside and bolted to both. It is apparent that this mode of construction cannot be so strong as with crooked-grown floors and futtocks, which retain their full size at the butt; and it is therefore evident that ships built of such straight timber are not well adapted for cargoes of iron, machinery, and other heavy goods; they require to be strengthened with iron riders running from the lower deck, far enough down to receive two bolts in the floor timber heads.

**WEIGHT OF CAST IRON PIPES, 12 inches long, in Pounds
avoirdupois.**

Diam. of bore in inches.	THICKNESS IN INCHES.							
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{2}$
1 $\frac{1}{8}$	lbs. 6'9	lbs. 9'9	...	...	...	...	...	...
2	8'8	12'4	16'3	20'4	...	...	...	...
2 $\frac{1}{8}$	10'7	14'9	19'4	24'1	...	...	...	...
3	12'5	17'4	22'4	27'8	33'6	39'7	46'0	...
3 $\frac{1}{8}$	14'4	19'9	25'5	31'5	37'9	44'7	51'6	...
4	16'2	22'3	28'6	35'2	42'3	49'6	57'1	65'1
4 $\frac{1}{8}$	18'1	24'8	31'7	38'9	46'7	54'6	62'7	71'2
5	20'0	27'3	34'9	42'7	51'0	59'5	68'3	77'4
5 $\frac{1}{8}$	21'9	29'8	38'0	46'4	55'3	64'5	73'9	83'6
6	23'7	32'2	41'1	50'1	59'6	69'4	79'4	89'8
6 $\frac{1}{8}$	25'6	34'7	44'2	53'8	63'9	74'4	85'0	96'0
7	27'4	37'2	47'3	57'5	68'3	79'3	90'6	102'2
7 $\frac{1}{8}$	29'3	39'7	49'4	61'2	72'6	84'3	96'2	108'4
8	31'1	42'2	53'5	65'0	77'0	89'3	101'8	114'6
8 $\frac{1}{8}$	33'0	44'7	56'6	68'7	81'3	94'3	107'4	120'1
9	34'9	47'1	59'6	72'4	85'7	99'2	112'9	127'0
9 $\frac{1}{8}$	36'8	49'6	62'7	75'1	89'0	104'2	118'5	133'2
10	38'6	52'1	65'8	79'9	94'3	109'1	124'1	139'4
10 $\frac{1}{8}$	...	54'6	68'9	82'6	98'6	114'1	129'7	145'6
11	...	57'0	72'0	87'3	103'0	119'0	135'2	151'8
11 $\frac{1}{8}$	...	59'6	75'1	90'0	107'3	124'0	140'8	158'0
12	...	62'0	78'2	94'7	111'7	128'9	146'4	164'2
13	...	...	84'4	102'2	120'4	138'8	157'5	176'6
14	...	...	90'6	109'6	129'0	148'8	168'7	189'0
15	...	...	96'8	117'0	137'7	158'7	179'8	201'4
16	...	...	...	124'5	146'4	168'6	181'0	213'8
17	...	...	...	131'9	155'1	178'5	202'1	224'2
18	...	...	...	139'4	163'7	188'4	213'3	238'5
19	...	...	...	...	172'4	198'3	224'4	250'9
20	...	...	...	...	181'1	208'2	235'6	263'3
21	...	...	...	...	...	218'2	246'7	275'7
22	...	...	...	...	...	228'1	257'9	288'1
23	...	...	...	...	...	238'0	269'0	300'5
24	...	...	...	...	...	247'9	280'2	312'9

NOTE. The first column is the width of the pipes expressed in inches and parts of an inch ; the remaining columns are the weights of the pipes, under the different thicknesses in which they are placed. Two flanges are generally reckoned equal to one foot of pipe.

569. In the case of the *Trafalgar*, RITSON v. TYRER, Liverpool, 27th August, 1855, the owner was held liable for damage to casks of porter stowed below 200 tons of heavy goods consisting of iron and boxes of bacon. At Syra, if iron forms part of the cargo, and different lots get mixed, the master has to pay the cost of separation.

570. **Pig iron.** In January, 1867, there was an enquiry at Glasgow, before Justices STEDMAN and MACLEAN, and Messrs. BAKER and SWINBURN, nautical assessors, by Mr. O'DOWD (Board of Trade), who stated that the barque *Torfrida*, registered 415 tons, was 133 feet long, 28 broad, 16 deep, and only 8 months old. Capt. SCALLOW and 13 hands left Glasgow in her 1st October for New York, with 550 tons pig iron and 125 tons miscellaneous goods—675 tons. Three days after, when near Antrim, she made 8 inches water per hour, and returned 8th October to Greenock. The cargo was unshipped and the barque placed in dry dock, when it was discovered that she had strained very much and had sunk amidships; she was repaired, the cargo was re-stowed, but about 103 tons were left out. She left again 5th November, and on the 22nd, when 160 miles west of Mizen Head, sprung a leak. They bore up and kept the pumps going until 5 p.m., when the wind became light, and a heavy cross-sea caused the ship to labour, and the leakage increased. On the 23rd, at 11 p.m., she went down; the crew escaped in their boats. The court considered it reprehensible to re-load the barque with so much pig iron, as there was no doubt the leak which compelled her to put back first arose from the fact that in addition to other cargo she had upwards of 150 tons of pig iron more than her register tonnage and although 103 tons were left out subsequently, there was yet too much. The court recommended as a rule that all wooden vessels should not carry more than their registered tonnage of pig iron in addition to other cargo. A master who took in a cargo of pig iron at Troon, in May, 1863, complains that on delivery at Swansea £3 2s. 6d. was deducted as the first cost of 1 ton 5 cwt. of the cargo, although the sand and rust off the iron was quite equal to that deficiency.

CAST IRON BALLAST (ADMIRALTY), EACH PIG.

Length.		Breadth.	Depth.	Weight.			No. to Ton.
ft.	in.	in.	in.	c.	q.	lbs.	pigs.
3	0	6	6	2	3	12	7
2	0	4	4	—			20
1	6	6	4½	1	0	12	21
1	6	6	3	—			28
1	5½	5	4½	1	0	18	18
1	5	5½	4½	1	0	0	—
1	4½	5	4	—			20
1	0	4½	4	0	2	0	—
1	0	4	4	—			40

There is another Admiralty table under the article ballast.

571. The BUTE Insurance Club limit iron cargoes as follows:—All ships, except British A.L., 3-3rd 1-1. and those employed in the coasting trade, loading iron, shall not exceed the following ¢ centage, viz.: 100 to 200 tons, 35 ¢ cent. over register N.N. tonnage; 200 to 250, 30 ¢ cent.; 250 to 300, 27½ ¢ cent.; 300 to 400, 25 ¢ cent.; 400 to 600, 20 ¢ cent.; 600 to 800, 15 ¢ cent.; 800 to 1,000, 12½ ¢ cent.; 1,000 to 1,200, 10 ¢ cent.; 1,200 to 1,400, 7½ ¢ cent.; 1,500 5 ¢ cent.; pig iron and lead, two-thirds register tonnage.

Tonnage. E.I.Co. 20 cwt. New York 20 cwt. pig and bar; Baltimore (and United States) 2,240 lbs. pig and bar; in Pennsylvania a ton of pig iron is 2,240 lbs. blooms 2,480 lbs., and bar 2,000 lbs. A vessel of 203 tons register could carry 50 tons of iron and 1,160 quarters of wheat.

Sizes and Weights. Some railway bars are 15 feet long, 2½ to 3 inches broad, and 5 inches deep; they range from 16 to 24 feet long—averaging 20 feet; the average weight 60 lbs. per yard. Great Western (broad gauge) bars vary very much; bridge rails are about 20, sometimes 24 feet long and 62 lbs. per yard. South Western (narrow gauge bars are usually 21 feet long, and weigh 75 to 80 lbs. per yard; fish-plates are about 18 inches long and weighs 12 lbs. A cubic foot of cast iron will weigh on an average 450 lbs., wrought 475 lbs. and close-hammered 480 to 490 lbs.. A stone of iron 14 lbs. Particulars of chain cables, wire, &c., are detailed in the article rope, which see.

Foreign Weights, &c. 75 lbs. Stockholm=56 lbs. English, 100 pounds Swedish=76 lbs. avoirdupois, 133½ pounds Swedish=100 lbs. avoirdupois. A Bremen and Bremerhaven waage=120 lbs. An Amsterdam last of iron or copper for general freight 4,000 lbs.

572. IRON SHIPS.—**Stowage.** Mr. GRANTHAM, C.E., says—“the shell of a timber-built vessel is so much thicker than that of an iron vessel, that with the same outside dimensions, the hold of the latter is frequently 18 inches wider and 12 inches deeper than the former. Taking the most favourable part of a vessel—namely, in the centre of the length—in a vessel of 200 ton, the internal capacity in favour of the iron vessel will be as 5 to 6; but in the ends, which are drawn finely off, the disparity is much increased, making the proportion of the whole contents about as 4 to 5. Supposing, therefore, that a vessel built of timber could stow 200 tons, she would, if made of iron, have room for 250 tons. The total capacities of the largest vessels will probably not approximate nearer than as 5 to 6; making the iron ship of 600 tons burden not to exceed in outward dimensions the timber one of 500 tons. The advantage of this is very great and enables an iron vessel to trade, and remunerate the owners, in cases in which a wooden vessel would not return a profit; for, if we suppose that the freight of a 500-ton ship would just pay the expenses required to navigate her, an iron vessel would leave the freight on the extra 100 tons as clear profit. With steamers,

the comparison is even much more in favour of iron. As the average cargo of a steamer is only, perhaps, about one-half of the load, in engine, cargo and coals together, an increase of one fourth in her stowage adds 50 ¢ cent. to her capacity for carrying cargo ; so that to carry a given cargo, the iron steamer may be much less than a wooden one."

573. **Iron ships—interior.** Capt. FITZROY, R.N., says—"iron ships require abundant ventilation internally, on account of moisture that is deposited when sudden and considerable changes of temperature occur." For this reason, the Russian Fur Company on the Amoor river, prefer sending their goods in wooden ships, which are selected also for the same reason by many merchants for the conveyance of tea ; see the article tea.

574. Mr. WIGRAM stated before the Committee of the House of Commons, 24th February, 1860, that "There are some things which iron ships can never be so advantageously employed to carry as wooden ones. For instance, there is sugar : such is the drainage from sugar brought over in iron ships, that it corrodes and eats away the bottom of the ship in the most rapid and extraordinary manner."

575. In the year 1875, a steamer then only two years old had some of her plates so eaten away as to require shifting.

576. The injury from the drainage of sugar is greatly increased when diluted with bilge water, as by fermentation acetic acid is formed, which dissolves the iron. The action of sugar on iron may be recognized by the brightness of surface induced. The iron will not be permanently protected with a white or red lead paint ; an iron paint composed of the peroxide of iron, which is of a reddish brown colour, is said to be the most effective ; this covered with a thick coat of whitewash, will so protect the iron that injury need not be feared.

577. An importer says—"the difficulty is now overcome by coating the iron with a layer of asphalt or Portland cement, the lime in which neutralizes the corrosive action of the sugar. Occasionally a further protection is afforded by laying a floor of sheet lead so as to receive the drainage of syrup or molasses and conduct it into a well, where it is pumped into tanks or casks provided for the purpose."

578. A builder says—"that by the acidity of the bilge water the plates in the bottom become corroded ; the heads of the rivets are also constantly wearing off, especially where sand, grit, or any hard substance, such as a ball formed of coal dust and oil droppings, was passed and re-passed over them by rolling at sea. Coal dust, mixed with the droppings from brass, is also injurious. To remedy this

the bottom is now carefully covered with cement or asphalte up above the rivet heads. Those portions of the vessel at the extreme ends, just above the keel, where the space is too narrow to admit of their being cleaned or painted, may be advantageously filled up solid in the same manner." The *Liverpool Underwriters* require that "fresh Portland cement shall be laid on so as to cover the frames and rivets heads. The cement is to be raised in the centre to the level of the limber holes, and to be taken up to the upper part of the bilge." All the lower compartments of H.M. iron ship *Warrior* are filled in with brick-work to prevent the accumulation of bilge water.

579. Where some remedy is not applied, it is recommended that a small quantity of water from the sea, should be let into the ship daily and pumped out again, the strength of the acid will thus be kept down, and the ship remain sweet and clean. The insides of iron ships, are also injured by salt, saltpetre, &c.

580. Mr. PEACOCK, who has made the subject his especial study, observed that on the *inside* of old ships, where copper pipes have lain in the bilge, or the urine of cattle, or brine from the boilers had lodged under the angle-iron frames, and where the rivet heads and plates had not been properly coated, or on the outside where metal valve seatings occurred, great deterioration took place. Injury from salt-water is increased when brass is near. It is stated that a penny piece accidentally dropped into the bilge of an iron ship and left there for a year, had nearly corroded through, within one-sixteenth of the outer surface, so that had it not been discovered, the steamer might have eventually foundered at sea. The iron steamer *Prince of Wales*, had a round hole, of four inches diameter, eaten through the bottom by her copper pump; but for the discovery she would have foundered. The constant dropping of the sounding rod is likely to injure the plate immediately below, if not protected; it has made a hole through the bottom of a steamer.

581. To preserve the interior from oxidation, Mr. GRANTHAM says—"good paint becomes a perfect enamel, and while carefully renewed periodically, no sensible decay is perceptible. But to do this requires great care and constant watchfulness. Good white lead is perhaps the best application, but red lead is preferred, though, probably, without any satisfactory reason. Care should be taken that paint is applied under the frames before they are rivetted to the plates, and that no wood should be allowed to come into contact with the iron without a similar thick coat of paint being previously applied. It has been customary, in some cases, to apply a coat of boiled oil to the plates and frames while building, to prevent corrosion, when they

are necessarily exposed to the atmosphere." This is, doubtless, a wise step ; but the oil should be kept from touching those parts which are to form the joints. For some information applicable to the preceding, see dunnage, iron, and metals.

582. In one case where a master had some copper sheathing to carry, he placed it alongside and touching the iron framework and plates of his vessel. Considerable damage was done to the iron by galvanic action, and much worse consequences would have ensued had there been any salt-water also in contact. An iron ship has been much injured by laying some months alongside a copper bottom ship, that had her copper bottom in contact with the iron ship.

583. With ordinary precautions it would be nearly impossible for a fire to take place, or to gain head, in the hold of an iron ship, provided the hatches were properly secured ; for the bulkheads make each division perfectly air-tight, and effectually stop out the atmospheric air, without which fire will not burn,—thus confining the injury, when it does occur, to the compartment in which it originates.

584. The Liverpool Underwriters' Association call the attention of commanders and officers of iron ships to the following remarks :—

Newly-launched iron ships, while fitting out, should be kept, if possible, with the head in the opposite direction to that in which they were built, or so near to it as circumstances will permit.

Compass deviations observed in port should be tested at sea as soon as opportunity occurs, especially in new iron ships. The vibration of the machinery in iron steamers may effect the magnetism of the ship, and cause a small alteration in the deviation of the compass.

Compass deviations usually change in amount very gradually as the ship changes her geographical position. The deviations of a compass placed near vertical iron, like a steering compass, generally change more, on change of geographical position, than those of an elevated or standard compass. This change may not show itself while the ship is upon certain courses, but must be guarded against when the course is altered. When an iron ship has been long on one course, and then is put on a new course, she is likely to err in the direction of the old course ; thus a ship, after being for some time on a westerly course, and then changing to north or south, will go to the west of her new course.

Besides the ordinary deviation of the compass, there is a deviation caused by the heeling of iron ships, which may increase or decrease the deviation observed when the ship is upright.

There appears to be no deviation from heeling when the ship's head by compass is east or west, but it increases as the ship's head

is moved from these points, and is greatest when the ship's head by compass is near north or south. Cases have been observed in which the deviation resulting from heeling has amounted to as much as two degrees for each degree of heel of the ship—that is, without altering the real direction of the ship's head the apparent alteration in direction has amounted to 40 degrees, by heeling the ship from 10 degrees to starboard to 10 degrees to port.

In north latitude, in ships built head to the northward, with their compasses in the usual position, the deviation from heeling is much larger than in ships built with head to the southward. In north latitude, the north end of the compass needle is drawn to the high or weather side of the ship, as she heels over; the effect being when this deviation is not allowed for, that an iron ship, with a list on northerly courses goes to windward of her apparent course, and on southerly courses goes to leeward of her apparent course. The deviation which arises from the heeling of the ship will vary with the dip of the magnetic needle. In high south latitudes, where the dip is south, the north end of the needle has been observed to deviate towards the low side of the ship. A small deviation towards the low side of the ship has also been observed in north latitude, in some ships which were built in a southerly direction.

It is desirable, therefore, that all iron ships which are liable to heel over should be swung, at least once, with a list to port and with a list to starboard, as well as upright, so as to enable the navigator to estimate what allowance he must make when the ship heels at sea.

A properly trained compass adjuster, with the requisite instruments, can ascertain very nearly what the heeling error will amount to, and can approximately correct it with a vertical magnet, without actually heeling the ship; but until compass adjusters shall be invariably submitted to an examination to test their competency, the only safe plan is to heel and swing the ship so as to ascertain the actual heeling deviation.

The compasses of those iron ships which change their latitude very much cannot be properly compensated by fixed magnets only, but should be partly corrected by vertical iron. The record of careful observations made in high southern latitudes for ascertaining the deviation of the compass when ship's head by compass is east or west, will greatly assist the compass adjuster in perfecting the magnetic compensation of the compasses whose deviations are so observed.

The caps and pivots of the compass cards should be frequently examined at sea, and the blunt pivots and the cracked or otherwise injured caps should be replaced by new ones. Compass errors arising

from mechanical causes of this kind are not unfrequent, and are often wrongly attributed to changes in the magnetism of the ship.

The Admiralty variation chart of the world, constructed by Staff-Commander F. J. EVANS, R.N., will be found of great service in ascertaining how much of the total error observed by amplitude or azimuth in the compasses of iron ships is due to variation, and how much to deviation.

The azimuth tables for latitudes between 30 degrees and 60 degrees inclusive, by Staff-Commander J. BURWOOD, R.N., published by the Admiralty, give the sun's true bearing for nearly every degree of azimuth through the day, so that by inspection only, when time at ship's place is known, the true direction of the ship's head may be at once ascertained.

The "Admiralty Manual," for ascertaining and applying the deviations of the compass, containing charts of magnetic variation, horizontal intensity, and dip; Towson's "practical Information on the Deviation of the Compass, for the use of masters and mates of iron ships;" the Reports of the Liverpool Compass Committee, and other works connected with the magnetism of iron ships, published by the Admiralty and Board of Trade, may also be consulted with advantage.

W. W. RUNDELL, *Secretary*.

Underwriters' Rooms, Liverpool, 17th Feb., 1870.

In the P. and O. Steamers and other well conducted ships, the error of the compass is ascertained when possible at least twice a day (morning and evening), by azimuth and amplitude.

585. **Iron Ships—Bulkheads.** Mr. COURT, Secretary to the Liverpool Underwriters' Association, issued the 1st January, 1859, a Report on bulkheads. In reference to section 9, it may be said that compensation in strength should always be made for the metal taken out of the plates where the bulkheads are rivetted to the ship's sides. Vessels have been known to break in two (especially when unequally laden in different compartments), at the line of bulkhead, owing to the rigidity of the hull at this part, and to the fact that the rivets run in a direct line from keel to gunwale, post-office stamp fashion. It might be better for the angle iron of the bulkheads to be made with a wider flange, by which space would be obtained for spreading the rivets, and thereby avoiding the direct line. Longitudinal bulkheads give strength, and are of great assistance for stowing a shifting cargo, or where there are different goods liable to injure each other. A midship partition carried from the foremost bulkhead through to the aftermost one would, in combination with the three intermediate

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bulkheads, render the ship longitudinally much stronger, and safer to withstand any casualty that may occur; see next page. Bulkheads frequently rust away at the point where they connect with the floor plates, so that when they are wanted they are found useless. Every officer in a ship that is fitted with iron bulkheads should make himself acquainted with all the doors and valves in them, it should not be left to the engineer or carpenter individually.

MR. COURT'S REPORT ON BULKHEADS IN IRON SHIPS.

SECTIONS 1, 2, and 3, are introductory.

SEC. 4. To determine the size of the compartments we have the following data, viz;—merchant vessels generally load to about seven-tenths of their extreme capacity; that is to say, if the extreme outside dimensions, representing the buoyant power of a vessel, be ten, the weight of ship and cargo is generally about seven-tenths of this quantity. Vessels laden much beyond this are considered deep. We have, therefore, in general, about three-tenths of the extreme buoyancy of the vessel as a margin, and if this three-tenths be destroyed by leakage arising from accident, or otherwise, the vessel will sink in still water; but in a seaway, the motion of a vessel from the summit of a wave to its base generates a momentum downwards, and the consequence would be that the vessel would sink in a seaway some time before the margin of three-tenths was destroyed. From this it would appear that if a vessel be divided into four equal compartments by three watertight bulkheads, and one of these compartments be filled with water, such vessel would be *just* safe in a seaway, because nine and a half-tenths of her buoyancy only would be destroyed,—seven-tenths by the weight of the cargo, and two and a half tenths by the destruction of the injured compartment.

5. *Practically*, it is difficult accurately to divide a vessel into four equal compartments, and it would also be inconvenient, because the forward and after bulkheads would be thrown much too far from the ends of the vessel.

6. The practice laterly has been to put a bulkhead at each end, so as to shut off the space devoted to ship's use from the rest of the vessel. The united contents of these portions vary a little above or below one-tenth of the vessel's extreme capacity in cargo-carrying ships. Now, assuming this one-tenth as the amount required to resist or overcome the descending momentum of the vessel in a seaway (referred to above), and dividing the space between the end bulkheads into four equal, or nearly equal, compartments, by three additional bulkheads, we have provision for nearly every case of emergency.

7. These remarks are independent of the character of the cargo; if of iron and one compartment be filled with water, the vessel will lose the buoyancy due to that compartment, less one-seventh of the weight of iron in it, as the specific gravity of iron is one-seventh less in water than in air. Thus,—if a vessel of 1,600 tons register be laden with iron down to 20 feet, and having a dry side of $6\frac{1}{2}$ feet out amidships, ship and cargo weighing about 3,500 tons, such vessel would, if one of these equal compartments were stove in, increase her draught to $24\frac{1}{2}$ feet from such cause. With salt or coal the increased draught would be $2\frac{1}{2}$ or $22\frac{1}{2}$ feet in all; with East India produce the draught would gradually increase

to about 23 feet as the water was absorbed. With cotton the difference increases gradually, the rate being slower the harder it is pressed; this applies also to fine goods hard pressed and well bound.

8. Vessels have been built with one, two, and three bulkheads; some with one forward and one amidships, others with one at each end and one amidships; but they invariably show signs of hardship at the places where the bulkheads are attached to the side, loosening the rivets, and, in some cases, cracking the plates through the holes where extra means have not been taken to secure them.

9. It would seem, then, that bulkheads in an iron ship, except they be numerous enough for safety, are *useless*, and even injurious, by creating rigid places; but where there are enough, they become important as ties, thus preventing vibration and alteration of shape, and diffusing local strains over the whole fabric, besides providing security against collision, grounding, &c. *At least five bulkheads* are required for vessels loaded to seven-tenths their extreme capacity, and they require to be arranged in the manner pointed out in section 6.

10. The introduction of fore and aft partitions in the *Great Eastern* might be advantageously copied into merchant vessels, and would take the place of keelsons, stanchions, &c.

JOHN JORDAN, *Surveyor of iron ships.*

586. **Exterior.** All cases of deterioration of iron, whether in the hulls of ships when lying long in port, bobstay bolts and chains, and chain cables at the water-line in a copper-bottomed ship, paddle-beam spurs, &c., are generally traceable to the action of copper in the presence of sea-water. It is stated that the contact of the iron plating of *La Gloire*, French ship-of-war, with her copper sheathing, produced a strong galvanic action injurious to the ship, and that a quantity of wine in the hold was entirely spoiled by it. A number of exceedingly sensitive shell-fish of a species unknown in 1862 were found attached to her bottom. The plates of an iron ship's bottom have frequently been found seriously honey-combed near and around the *metal* valve seatings. In 1844, when H.M. Steam-Sloop *Cormorant* went (under canvas only) from Tahiti to Valparaiso, the floats were removed and the paddle-wheels lashed; on arrival it was found that the *lower* inner arms of the wheels (those nearest the ship) were eaten away by galvanic action induced by her copper sheathing, but the other arms remained intact. The after keel and stern post of an iron ship of war has been much corroded by her having a gun-metal screw propeller. There are instances of the corrosion of iron ship's bottoms by their being laid up in dock alongside vessels with copper or yellow metal on their bottoms. When pustules of oxide are found on iron ship's bottoms which have always used red lead, they have arisen most probably from galvanic action induced by copper in some form or other being near, or by the partial use of preparations containing copper in some shape or other. Several steam companies determined in 1862 to discontinue the use of red lead for coating iron

ships inside or out ; they found that where a blister occurred, water had gathered underneath, and that by some combination of the paint and iron with the water, the latter became acidulous, and invariably destroyed the surface of the iron and corroded it. These companies now used zinc paint, and fill all interstices with a cement made in part with iron filings, forming a kind of asphalte. The contact of lead, such as pipes, &c. with iron, is now in all cases avoided. Iron is injured almost as much by contact with lead as with copper. When the surfaces of wrought iron and cast iron are brought near each other in sea-water, they furnish the elements of an active electrical battery and consequent loss of material. Through this a cast iron tank, 160 feet long by 40 wide and 5 deep, fell to pieces in Portsmouth dockyard, in June, 1863 ; the tie rods, which were of wrought iron, had lost a material portion of their original substance.

587. Iron Ships—Compasses. The Underwriters at Liverpool, published, 14th May, 1862, a valuable report on this subject, which is given at length below. This report is followed by the specifications of the iron screw steamship *Himalaya*, built by Messrs. MARE & Co., for the PENINSULAR AND ORIENTAL Co., and sold by them to the Admiralty.

Newly-launched iron ships, while fitting out, should be kept, if possible, with the head in the opposite direction to that in which they were built, or as near to it as circumstances will permit. Compass deviations observed in port should be tested at sea as soon as opportunity occurs, especially in new iron ships. The vibration of the machinery in iron steamers may affect the magnetism of the ship, and cause a small alteration in the deviation of the compass. Compass deviations usually change in amount very gradually as the ship changes her geographical position. The deviation of a compass placed near vertical iron, like a steering compass, generally changes more, on change of geographical position than those of an elevated or standard compass. This change may not show itself while the ship is upon certain courses, but must be guarded against when the course is altered. When an iron ship has been long on one course, and then is put on a new course, she is likely to err in the direction of the old course : thus a ship, after being for some time on a westerly course, and changing to north or south, will go to the west of her new course. Besides the ordinary deviation of the compass, there is a deviation caused by the heeling of iron ships, which may increase or decrease the deviation observed when the ship is upright. There appears to be no deviation from heeling when the ship's head by compass is east or west, but it increases as the ship's head is moved from these points, and is greatest when ship's head by compass is near north or south. Cases have been observed in which the deviation resulting from heeling has amounted to as much as two degrees for each degree of heel of the ship ; that is, without altering the real direction of the ship's head, the apparent alteration in direction has amounted to forty degrees, by heeling the ship from ten degrees to starboard to ten degrees to port ! In north latitude, in ships built head to the northward,

with their compasses in the usual position, the deviation from heeling is much larger than in ships built with their head to the southward. In north latitude, the north end of the compass needle is drawn to the high or weather side of the ship, as she heels over; the effect being, when this deviation is not allowed for, that an iron ship, with a list on northerly courses goes to windward of her apparent course, and on southerly courses goes to leeward of her apparent course. The deviation which arises from heeling will vary with the dip of the magnetic needle. In high southern latitudes, where the dip is south, the north end of the needle has been observed to deviate towards the low side of the ship. A small deviation towards the low side has also been observed, in north latitude, in some ships which were built in a southerly direction. It is desirable, therefore, that all iron ships which are liable to heel over should be swung, at least once, with a list to port and with a list to starboard, as well as upright, so as to enable the navigator to estimate what allowance he must make when the ship heels. The compasses of those iron ships which change their latitude very much cannot be properly compensated by fixed magnets only, but should be partly corrected by vertical iron. The record of careful observations made in high southern latitudes, for ascertaining the deviation when ship's head by compass is east or west, will greatly assist the compass adjuster in perfecting the magnetic compensation of the compasses whose deviations are so observed. The caps and pivots of the compass cards should be frequently examined at sea, and the blunt pivots and cracked or otherwise injured caps should be replaced by new. Compass errors arising from mechanical causes of this kind are not unfrequent, and are often wrongly attributed to changes in the ship's magnetism.

W. W. RUNDELL

Swinging iron vessels for adjustment. "There appears sufficient reason for swinging a new iron ship or steamer immediately before each of the first two or three voyages: that all iron vessels should be swung immediately before the first voyage following any considerable repair; whenever the position of the standard compass is changed; or when the master is changed, unless he had charge as chief officer the preceding voyage."

IRON SCREW STEAM SHIP HIMALAYA—SPECIFICATIONS.

Dimensions. Length of keel 340 feet, beam 44 $\frac{1}{2}$, deep 31 $\frac{1}{2}$; 3,437 tons.

Keel, bar-iron 10×5 inches, to be rabbeted half the thickness of garboard strake into the keel; other half rounded over.

Stem, 16 inches broad at bottom 5 inches thick, and checked same as keel to where the cutwater comes on the stem, and to be 8×4 inches at the top.

Stern Post, 10 inches broad and 5 inches thick, tapering to 10×4 inches at the spar deck, and a heel left on the after side to bear the rudder, with eyes for the pintles, turned so as to form a knee forward on the keel. The plate aft to run over the post to form a place for the rudder.

Frames, of angle-iron 7×5× $\frac{1}{4}$ inches for 120 feet in midships, 20 inches from centre to centre, extreme fore and aft that, to taper to 21 inches 6×4× $\frac{1}{2}$ inches; 22 inches 5×3 $\frac{1}{2}$ × $\frac{1}{2}$ inch; and 24 inches 4 $\frac{1}{2}$ ×3 $\frac{1}{2}$ × $\frac{1}{2}$ inches. The butt plates to fill up the space between the frames, so as to form a series of trussings

throughout the vessel's body. In engine and boiler space, and for ten frames before and abaft it, the frames to be doubled in the bottom, and a reverse angle-iron on every second frame from floor to gunwale $4 \times 3\frac{1}{2} \times \frac{1}{2}$ inches the whole length of vessel, for fastening the ceilings to.

Plates. Garboard strake for 150 feet in midships, $1\frac{1}{2}$ -inch plates as broad as can be procured or worked; remainder fore and aft taper by $\frac{1}{4}$ inch to the extreme end to $\frac{1}{2}$ inch; bottom plates to $\frac{1}{2}$ inch to the 6 feet water-line for 160 feet in midships, before and abaft this $\frac{3}{4}$ inch from the 6 feet water-line to gunwale $\frac{1}{2}$ inch, except the upper plate 2 feet 6 inch broad by $\frac{7}{8}$ inches thick, to form the waterways; all double rivetted from keel to gunwale, and all butts to be flush; upper strake to go to top of waterway. Spar deck plates $\frac{1}{2}$ inch thick; all spaces formed by projection of the plates to be fitted with liners, so as to avoid using small pieces of rings. The butts to be perfectly close, as well as the seams; no pieces will be allowed to be put and caulked over. The countersinking to be carefully done, and all the rivets to be full and smooth outside of plates and to be chipped down while hot. In punching to take great care to prevent unfair holes.

Floors, 22 inches deep in engine and boiler space, of $\frac{1}{2}$ inch plates, with angle-iron $4 \times 3\frac{1}{2} \times \frac{1}{4}$ inch on top of every floor, to run from 3 to 5 feet up the turn of bilge, the floors in fore and aft hold to be 22 inches deep, $\frac{1}{4}$ inch thick, with angle-iron on top $4 \times 3 \times \frac{1}{4}$ inches. The floor plates to run 4 feet on the turn of bilge over each side of frame in one piece.

The main **keelson** in midships to run the whole length of the vessel on top of the reverse angle irons, and floors to be 16×18 inches and $\frac{1}{2}$ inch thick, the side keelsons to run as far fore and aft as the vessel's mould will admit. Keelsons in engine room as required by engineer.

Breast-hooks, 5, 11 feet long, $\frac{1}{2}$ inch thick secured to frames by reverse angle-irons well rivetted; one crutch on fore and aft peaks, running square to point of contact.

Pillars in holds, between keelsons and beam, 4 inches diameter.

Bulkheads water-tight, one in fore peak, one before the engines, one aft the boiler, one in after hold; all to be $\frac{1}{2}$ -inch plate, tapering to $\frac{3}{4}$ inch at top plate, stiffened with $4 \times 3\frac{1}{2}$ inches angle-iron 3 feet 6 inches apart.

Beams. For upper deck, plate, $9 \times \frac{1}{2}$ inch, with two angle irons on top, $3 \times 2\frac{1}{2} \times \frac{1}{2}$ inches, finished on lower side with angle-irons $2 \times 2\frac{1}{2}$ inches, as described for main and lower decks. Main deck, of plate, $12 \times \frac{1}{2}$ inches with 2 inches angle-irons on top, $4 \times 3\frac{1}{2}$ inches. Beams and knees to be all welded in one piece, except in engine and boiler space, where they will be in lengths to allow the machinery to go down to the vessel, and to have angle-iron $4 \times 3\frac{1}{2} \times \frac{1}{2}$ inches on each side of top edge, finished on lower edge with $\frac{1}{2}$ inch round iron, or angle-iron, $3\frac{1}{2} \times 3 \times \frac{1}{2}$ inches, to run over end of beam plate at least 3 feet, or as may be decided on. Lower deck of $11 \times \frac{1}{2}$ inches, with $4 \times 3\frac{1}{2} \times \frac{1}{2}$ inches angle-iron on top; lower edge finished as main deck.

Stringers. Angle-iron all round the gunwale, $6 \times 4\frac{1}{2} \times \frac{1}{2}$ inches, with a covering-plate, $26 \times \frac{1}{2}$ inches, rivetted to gunwale and to upper side of deck beams; same in main and lower decks, $26 \times \frac{1}{2}$ inches. To have aft, five diagonal iron straps, $8 \times \frac{1}{2}$ inches, rivetted to reverse angle-iron.

Vessel to be **rivetted**, butt straps or plates to overrun strakes, tight and strong work.

588. When rounding the Cape of Good Hope, on her passage from Singapore, September, 1863, the *Dewa Gungadhur*, Capt. MACKENZIE sprung a leak below. Part of the cargo was got on deck and covered with tarpauling. A rivet was out of a butt in the third plate from the keel just abaft the foremast. The hole was plugged with wood. The first calm weather after, the master placed in it a permanent screw bolt prepared with gutta percha washers, outside and inside. It was thus accomplished :—A spiked nail was tied to the end of a skein of twine and forced through from inside ; other spikes were attached at intervals of two feet, until a sufficient quantity was paid out. The ship's bottom was then swept with a fishing line which caught the spikes, which were hauled on board. The prepared rivet was then lashed to the twine, the spikes were cut off and the end of the rivet secured ; the washers were then put on, the bolt screwed down, and all made secure. In another case, a cork was tied to the end of a long piece of twine and passed through the hole ; it came to the surface and gave place to a screw bolt, which was then pulled into the hole and secured.

589. ISINGLASS, a glue made of the sounds and air bladders of fish—the sturgeon especially, which is plentiful in the river Volga and the Caspian Sea ; specific gravity 1.111. Baltic in bales, receives same freight as clean hemp per ton of 44 poods gross ; in casks one-fourth more. A fat of isinglass $3\frac{1}{4}$ to 4 cwt.

590. IVORY, the tusks and teeth of elephants ; the best comes from Ceylon ; an inferior sort is obtained from the hippopotamus, wild boar, &c. It is also exported from Bombay, the Cape of Good Hope, and Alexandria ; specific gravity 1.825. In the East India trade it is usually stowed on the top of the cargo, between the beams. On the West Coast of Africa it is placed in the lazarette ; the negroes here commit great depredations while loading. Great care ought to be exercised when shipping large tusks in Bombay or Zanzibar, where they are freely used as beam fillings over cotton bales in one port and orchilla weed in the other. The tusks being hollow and brittle at the larger end, are very liable to be chipped and broken through the rough and careless handling of the black stevedores, when stowing ; and from the negligent manner in which they are placed, it frequently occurs that they are heard in heavy weather rattling and striking against each other. It is equally necessary when discharging, to look sharply after the dock labourers, as whole tiers of bales are broken out regardless of the beam fillings, and pockets, small bags, and large tusks, come down with a crash, to the manifest deterioration of the cargo. Sometimes it has occurred that

through such practices, several buckets full of broken ivory have been taken out of the hold of a Bombay ship, and claims have been made by consignees for deficient weights. Scrivelloes and teeth are always better packed in strong iron-bound cases. Packages of ivory from Alexandria are of most irregular form and weight, with the points of the tusks protruding and thus making them difficult to stow, especially when in contiguity to other packages which they are likely to damage considerably; they should be well blocked off with billet wood. Bombay ton 50 cubic feet of elephants' teeth in cases, and 16 cwt. in bulk. A tusk averages 60 lbs.

591. JACKWOOD. Bombay ton 50 cubic feet.

592. JAVA. VERITAS, in a letter to the *Shipping Gazette* of 29th September, 1869, says with reference to Home Chartering from Java,—“If shipowners and shipmasters charter home from Java, they should look well into the charter-party that there is not inserted therein that they will get paid freight for tobacco at the rate of 15 cwt. ₤ ton. Tobacco is not mentioned in the original East India Company's scale, but, of course, if the captain or owner has agreed per charter-party to take it at such a rate, he cannot expect to be paid else. It is only a roundabout way (not to use another word) for the merchants to make a large profit out of a ship so chartered. Tobacco should pay on an average at the rate of 9 cwt. per ton. Accordingly, if 15 cwt. are inserted, and have been chartered at £3 10s. ₤ ton, only £2 2s. ₤ ton will actually be got. The profit for the merchants on this article is too large to give the ship anything else than sugar for ballast if they can get it. There are several other articles, as arrack, hides, and so on, on which the merchants can get a nice profit by chartering on the East India Company's scale (they getting paid according to the Dutch tariff), but this is only a small loss to the owners in comparison with loading tobacco. There should be inserted in the charter-party, also, that rattans should only be shipped as dunnage, and as much as the master requires, otherwise he may expect that the charterers's agent at Java will threaten to give him nearly a full cargo of rattans if he does not agree to all their extra demands; and as rattans pay at the rate of 20 cwt. ₤ ton, the ship would not make a third of the freight expected. Again, let the quantity of casks of arrack be limited to say 50 or 100, for the merchant also makes a nice profit out of this, they get paid for each cask, while the ship should get paid for gallons delivered. It has occurred that a ship was loaded only with arrack and rattans. It is best to stipulate that at least two-thirds of the cargo should consist of sugar and (or) coffee, for with light goods the ship will make only

a poor freight ; although sugar is also bad for the ship, in particular when loaded in Batavia, where the baskets tare at least 7 $\frac{1}{2}$ cent."

593. JUTE consists of the fibres of two plants, the *chonch* and *isbund*, which are extensively cultivated in Bengal. It is shipped in the East Indies all the year round, but chiefly during the north-east monsoons ; nearly all at Calcutta ; very little at Bombay ; some from Manilla. Bales are excepted at an average of 300 lbs. each ; and sales are often made by anticipation in England at that weight. For freight a ton consists of five bales ; this rule prevails at Manilla, where the bales weigh almost invariably 280 lbs.—2 $\frac{1}{4}$ cwt. Ballast the same as for cotton—say 300 tons to 1,000 tons register. Jute is very liable to ignite through friction, and for this reason special attention should be paid when it is stowed in the same hold with other goods liable to be loosened by the movements of the ship at sea. Some masters will never stow jute near spirits, turpentine, or other inflammable liquids, for by the proximity of two such dangerous articles, there would be no chance for the escape of the ship should fire commence in the locality. With grain in the same hold a height of other goods should intervene. Bales of jute are roped very tightly but they have a tendency to swell, and there is some degree of danger in taking a full cargo, especially if damp, or the ground tier becomes wetted. The bales require to be closely examined when shipped to ascertain that they are not damp inside, the more so should they have been packed during the rainy season. Where the previous heated state of the jute has been observed, and the fore and after hatches have been opened, and windsails let down while passing through the tropics, the ship has been saved. The liability to spontaneous combustion, arising from being packed green, or imperfectly dried is stated to be at an end long before the termination of a voyage from Calcutta to England. When a portion only of the cargo consists of jute, due regard should be paid to its position in the hold, on account of this dangerous property.

594. The ship *James Pattison*, Capt. CROMARTY, was burnt to the water's edge when off the Azores in 1840 ; she had a large quantity of jute ; the fire commenced in the hold. The *James Baines* (77 days from Calcutta) was destroyed by fire in the Liverpool docks, in April, 1858. She registered 2,275 tons, was 250 feet long, 41 feet broad, and 28 feet deep. The 'twixt decks were discharged, and the lower hatches taken off in the presence of surveyors, on the 21st, when no damage of any kind was perceptible. On the 22nd smoke was observed, and a fire which commenced in the main hold soon destroyed her. The cargo remaining consisted of 2,200 bales jute, 6,213 bales

linseed, 6,682 bags of rice, and 40 bales cow hides; the fire was attributed to spontaneous combustion. The *Sutlej*, Capt. JAMES, was destroyed by fire in Calcutta in January, 1859; she had in saltpetre and jute, and it is conjectured that the latter became ignited, smouldered all night, and burst into flame in the morning, when the hatches were removed. As the fire reached the saltpetre loud reports were heard below, which terrified the crew, most of whom jumped overboard; five were drowned. The fact of spontaneous combustion in the vessels named, is disputed by masters who have brought full cargoes in good order, and by some experienced London merchants, who consider that the balance of evidence was "totally opposed to it;" they find that jute packed damp or green will be reduced to powder (in which condition it often arrives in England), but it will never fire. The manufacturers in Dundee, where large quantities are used, do not believe in spontaneous combustion. It is stated that jute has been tried in England in large quantities, mixed with oil and placed under glass to see if it would ignite, but it failed. It is also said that in England, fire has never yet been discovered to have commenced from the inside of a pile. The London Dock Companies and the Insurance Offices consider jute very inflammable, and require for it in warehouses a higher premium than for Russian hemp or flax, of which jute merchants complain. Through the fineness of the fibre, a portion of which is always exposed on the outside of a bale, jute will ignite with the least flame, which will run along a pile, but if there is no body of tow to come in contact it will die out. No unprotected light should be ever taken near it. Rope bands are preferable to iron, the rust of which destroys jute. It is said that jute hemp is capable of being loaded with its own weight of tar.

595. An owner writes to the *Shipping Gazette*, 8th December, 1865,—“I placed one of my ships in the hands of a house in India, to charter home. They engaged a certain quantity of jute, of five bales to the ton, but owing either to their unusually large size, or some other cause, the ship could not take the number they engaged, although she has not the quantity or number of tons of cargo in by 200 tons she has carrying capacity for, or what she had in before. Can I have the cargo re-measured on landing in this country, and claim freight according to such re-measurement; or am I to be a loser of the freight on the 200 tons deficient, and can the agent charge me with any extra freight for the jute shut out and shipped by another ship?” [The editor says—“The ship has a right to be paid at the rate of five bales to the ton on the quantity of jute

actually delivered, and to have the cargo re-weighd or re-measured to ascertain its real quantity and weight. The master should have objected to the manner in which the cargo was shipped, and protested against the same at the time. If the ship can show she was not in default she can claim for dead-freight.”]

Tonnage. Bengal and Madras ton 50 cubic feet in bales. At Calcutta 5 bales weighing 15 cwt., and measuring 46 cubic feet, go to a ton; when badly screwed, 50 cubic feet; when shipped by measurement only, 50 cubic feet compressed, in bales, weigh sometimes 17 cwt. Another authority says, a ton weighs 10 cwt. and measures 50 feet. A third authority says, 5 bales of jute at Calcutta are usually calculated to occupy 64 cubic feet, but they are stated to occupy 52 feet only. Calcutta bales loaded at Bombay, have measured 12 feet 6 inches each—62½ feet to the ton. Every removal increases the bulk of a bale.

596. KAOLIN, a porcelain earth, derived from the decomposition of the feldspathic granites, and much used for fine pottery. It is found in Assam and other parts of Asia, whence the name is derived.

597. KID GLOVES from England to some distant parts, are so liable to become spotted, that naval officers abroad, instruct their outfitters to wrap each pair separately in paper, place the whole in a bottle, and have it securely corked and sealed.

598. KING'S YELLOW and Orpiment, being a sulphuret of arsenic, is a poisonous material. Bombay ton 20 cwt.

599. LABRADOR AND NEWFOUNDLAND. The exports hence consist almost wholly of the produce of the fisheries, viz: seal and cod oil and blubber, in puncheons, hogsheads, tierces, and barrels; salted seal skins in bulk or in bundles of five skins each; dry cod-fish in bulk or in drums (rather shorter than American flour barrels but about the same diameter) containing a Portuguese quintal of 128 lbs. and boxes of one quintal 112 lbs.; and pickled fish (salmon and herrings) in tierces of 300 lbs., and barrels of 200 lbs. each. Oil, blubber, and skins are usually shipped to Great Britain and the United States; dry cod fish in *bulk* to Great Britain and Ireland, Spain, Portugal, and the Mediterranean; dry cod-fish in casks (all sizes) and boxes to the West Indies, Azores, and Madeira; dry cod-fish in drums and boxes to the Brazils; pickled fish (salmon and herrings) to Great Britain and Ireland, and the United States,—salmon to the Mediterranean and herrings to the West Indies. Dry cod-fish in casks is never exported from Labrador, consequently, pickled fish, which usually forms only part of a cargo, are not sent thence to the West Indies. The **first shipments** of the current year's catch and manufacture of fish and oil, generally commences

thus : pale sea oil and seal skins in June ; coloured seal oil in July ; dry cod-fish both from Newfoundland and Labrador in August ; cod oil in September ; pickled fish in September or October. Shipments from Labrador are not generally made after October, while from Newfoundland they are made until as late as May, and sometimes June, in the following years.

600. In reference to the Newfoundland trade an experienced merchant says "it is customary for the ship to find longer and the shippers dunnage and rinds, and beds and quoins for stowage. When loading **dry fish** in bulk, it is recommended to have sufficient longer (say firewood) in the bottom and bilges, and dunnage (say spruce boughs) over, to a depth altogether of six inches in the bottom and nine in the bilges. It is desirable to have rinds on the dunnage in the bottom to preserve the lower lines of fish from dampness, and it is necessary to have them against the topsides, bulkheads, pumpwell, and masts ; those in the bottom and as high as the hold beams, are generally placed transversely : those above longitudinally or fore and aft. The outside of the rinds next the fish is sometimes preferred, though they are as often placed the contrary way. In placing them fore and aft, and against bulkheads, &c., lap them so as to throw any drainage against the sides and bulkheads, and fasten them with scupper nails, or battens of small hoops, or sennet to prevent their slipping down. Stow the bottom lines of fish face up and then reverse, beginning all the lines from forward ; you can then work from all three hatchways at once, by stowing three separate lines at one time, for dispatch, which is desirable when the weather is uncertain ; and if a wet day or two should intervene the settlement will be so much the greater. In receiving lots from different shippers, divide them by turning the lower line of each face up and extend them fore and aft ; or divide them also into separate bulks athwartships, if necessary, by turning the last fish of every line the contrary way straight across the hold, and keep this division perpendicular to prevent the fish from being broken. By this means you can get at different lots at one time when discharging. If your vessel loads by the head, baulk forward when you get well up, or *vice versa*, and when your lading is completed and the fish settles down, spread spare sails over all, if you can, to keep the fish dry ; in fact, it is well to do so when between whiles as your loading progresses. With mixed cargoes of fish, oil, &c., have regard to your vessel's trim, and place the oil, which is lightest, forward or aft, or a proportion in each end. Put blubber and pickled fish under the oil ; keep the chimes of the casks as perpendicular as you can next the bulk fish,

and place dunnage between. Keep the bulk of fish all together, and do not stow it over the oil, as the pressure may cause leakage.

601. "In stowing a cargo of **oil and skins**, if you get the latter loose, make a bulk of them forward or aft in the bottom to trim ship, as they are heavy. If in bundles stow them away among the lower tiers of casks. In loading a cargo of drums for the Brazils, prefer clean stone ballast. A vessel of 200 tons register will require 30 to 40 tons. If you have not drums enough engaged to fill the ship, lay the ballast in the bottom as high as the keelson. If otherwise, stow some in the bottom and the remainder among the lower tiers, say up to the third tier. Ballast the same way for the West Indies, &c., unless you get pickled fish, which will answer the purpose. Use can-hooks for loading dry fish in casks, or pickled fish, but slings for oil or blubber. The Newfoundland tun of oil is 256 gallons."

602. **Labrador Trade.** After describing the best mode of loading salt, which will be found under that heading, a gentleman of great experience recommends the management of a vessel of say 120 tons as follows.

603. When chartered for the United Kingdom, you will probably have **oil and blubber** as well as fish; ascertain how much there is of each, the sizes of the casks, &c. The oil and blubber may go in the fore hold, as there is generally room left forward; should there be a full cargo, some ballast will be required forward among the blubber and oil to trim the vessel; as they take more room than the same weight in fish, there will be a chance of filling her up forward. Arrange the after ends of the casks in a tier; they will not then overhang or leak on the fish in the main hold. Blubber must be put below, as it is heavier than oil, and the casks more likely to burst; a puncheon of blubber should be at least four inches out—commonly called dry inches; when the cask is stowed, entirely remove the vent plug. If the blubber is *well* boiled before it is put in, it is not so likely to work, and the cask may be filled within two inches. If it has been rolled any distance, remove the vent plug to let out the air, and replace it before slinging; casks often burst for want of this precaution. The vent plugs of the oil require to be taken out for awhile, when they are stowed, and then replaced; these should be an inch out (dry inch) at least; for if the oil is new and the cask full, it is liable to burst. Let them all be bung up and well bedded and quoined, and secure each tier with salted seal skins, hides, old junk, or firewood.

604. Should the vessel be crank or likely to load by the stern, place ballast under or among the ground tier forward. If she is by

the head, the casks can be worked forward easier. Avoid lowering casks down the main hatchway, for if fish is stowed there and the gear gives way, or a cask bursts, the consequence will be serious ; do not use can hooks. When there is blubber and oil enough to make the vessel safe (presuming that she will not stand without ballast), land the remainder of the salt (see the article salt), dry the hold, and lay the longering, small fire wood, sticks, &c., fore and aft, next the keelson ; and along the bilges lay stout longers, to enable blubber from a bursted cask to get to the pump-well.

605. Dunnage generally consists of boughs of the spruce tree, cut after fine dry weather. A tight vessel will require six inches on the bottom, and nine on the bilges, and so taper off ; dunnage most where water is likely to lodge : take the depth by measuring under your feet to the ceiling ; lay it athwart the longers, as it will take less and leave the openings free for the passage of liquids. Cover the dunnage with rinds ; the lower line of fish will then turn out nearly as well as the other parts, otherwise it will be damp.

606. Place rinds up and down the sides, by securing the upper ends to the stringers or clamp pieces under the deck beams ; let the upper ends come far enough out under the deck to catch leakage from the waterways, which will then descend to the next rind, and so on to the bottom ; the rinds should overlap each other an inch or more. Place the rough or outside, being waterproof, next the ceiling ; by keeping the inside, which should be perfectly free from sap, next the fish, it will give the hold a cleaner and lighter appearance ; the outside blisters contain turpentine which will impart an unpleasant flavour to the fish. Many however prefer placing the inside of the rinds next the ceiling as they are more easily fixed, on account of their inclination to curl or roll up.

607. For securing the rinds to the sides, sennet, stout spun-yarn, or old straight wooden hoops, used batten-fashion, will do ; fastenings in the middle and at each end may be sufficient, but they ought to be well secured, for if after discharging fish the vessel should load a cargo requiring mats, the rinds may answer that purpose. Against the heads of the casks place sprigs of dunnage, with rinds water-shoot, on them. The custom is not to rind on the dunnage for the bottoms (some ships with caulked ceilings do not use rinds when ship and cargo belong to the same person), but to place the rinds fore and aft, over-lapping, to carry the water down between them and the sides, and to place them along as the fish come up the hold, without fastening. The objection to this is, that if the vessel is laden quickly, and gets into a rough sea, with a fair wind, she rolls

from side to side, and the fish not having settled, the rinds will slip down ; or, if on a wind, with a strong breeze, the fish settle off from the weather side, the rinds fall and are found in the bilge. Scupper nails will prevent this, but many will be required, as a vessel of 120 tons will take from 700 to 800 rinds. The shipper finds rinds and dunnage wood, &c., for stowing oils, &c. ; the ship finds longerings.

608. Should the fish not fill up the deck, spread spruce boughs, old spare sails, &c., on it ; let a man go into the hold occasionally, and secure a bucket under any leak which cannot be stopped, and lay swabs, canvas, bread bags, &c., to prevent water from working into the cargo.

609. In stowing commence by laying the first tier or line of fish face up and heads aft ; the next back up and so on, laying them regularly fore and aft, and as you come along the sides place the skinny parts next the rinds, as they are better able to bear the wet in case of leakage. Some prefer placing the edges there, because they consider the possible darkening of a dozen fish, about a quarter of an inch each, less injurious than the entire loss of one. Keep the fish solid all along the sides, to prevent cargo from working. In filling up avoid what is called longering or bulking ; fill right up to the deck in lines, which can be done by bringing three or four lines along together like steps ; the fish turn out better than when in small bulks or longers. Avoid separate bulks ; at all events do not bring them to the top separately, as the damp air will get between and spoil the appearance of the fish. When there is not a full cargo bank up in the centre, to prevent shifting at sea.

610. If taking all fish, consider how the vessel will load ; say, if to fill her up she would load by the head, first have a bulk in the after hold, and to give it time to settle stow forward till you come up as high, or a line higher, than it, then stow fore and aft. If it is desirable to take all she can and turn her cargo out well, stow singly, and the lines not too thick or stiff ; but if you wish to blow her up, stow three or four at a time, and carry along stiff lines. It is usual to begin aft and go on forward, then turn and come aft again, then forward and so on. In a crank or deep vessel, use stone ballast instead of longering, otherwise, if laden quickly with dry fish, she will not be stiff enough to carry her canvas in a breeze.

611. A certain schooner of 80 tons will take 2,100 quintals of dry cod fish, but is obliged to have 10 tons of iron ballast, and is not then stiff enough until she has been at sea a few days, and the cargo is settled. A vessel of 120 tons register will take say from 95 to

100 tons of oil, or 2,800 to 3,000 quintals of Labrador fish, or 2,500 to 2,600 Newfoundland fish. When it is expected to load a cargo of oil, some ballast must be secured for the ground tier, unless there are salted seal skins, hides, and old junk enough for the purpose. With larger ships, of which there are many of from 250 to 300 tons, it is frequently possible to discharge from one hatchway, and load at the others; these vessels trade mostly with the Brazils and the West Indies, and load fish in drums or casks, containing as previously stated, a Portuguese quintal of 128 lbs. of fish. A vessel of 150 tons register carried to the Brazils 2,007 tubs of Gaspè fish; nearly 15 tubs to the register ton.

612. Keep the pumps well watched, for a very little water will by the vessel's motion, cause a damp air to pass and repass continually, and a fish cargo cannot be kept too dry. If once a vessel gets a name for fair passages, and for delivering cargo in good order, it is of great consequence both to the owner and master. When discharging fish, cover the cargo fore and aft every time the hatches are put on, to prevent the damp air from injuring it; see fish, herrings, and pilchards.

613. LAC, a gum resin produced by an insect termed *coccus lacca*, which deposits it on the branches of certain trees in India, especially in Assam and Thibet, where it is found in a regular cellular structure, containing the eggs of the insect; its constituent parts are resin, a peculiar red colouring matter, gluten, and wax. It is imported into Europe under three forms, viz.: stick-lac, seed-lac, and shell-lac. Stick-lac is the first or crude state, as found encrusting the twigs and branches. For purification it is broken into small pieces, put into a long narrow canvas bag and exposed to a heat sufficient to liquify the gum, when it is forced out by twisting the bag over a plane-smooth surface, to which the liquid cannot adhere. In India it flows out and consolidates upon the convex surface of a plantain tree prepared expressly; the mucilaginous and smooth surface of this tree prevents it from adhering. In 100 parts of stick-lac, in its crude state, there are resin 68 parts, colouring matter 10, wax 6, gluten 5.5, extraneous matter 6.5. The colouring matter is a valuable product, and forms the basis of a beautiful red dye called lac-dye, the constituents of which are carbon, hydrogen, and oxygen; this colouring approaches that of cochineal, lake, and other pigments. Stick-lac thus purified and consolidated, being pounded in a mortar reduced into small grains, and a further portion of the colouring matter extracted by the process of boiling, constitutes the substance called seed-lac. The analysis of seed-lac gives, in 100 parts, resin

88.5, colouring matter 2.5, wax 4.5, gluten 2 ; it is sometimes melted and formed into cakes, and is then called lump-lac. Shell-lac is the lac in its natural state after the process just described of simple purification by heat, and is produced by liquifying, straining, and forming it into thin plates—whence its name shell-lac. Through this process a further proportion of colouring matter becomes extracted, the shell-lac plates being of a more transparent character than the stick or seed-lac. The analysis of shell-lac gives 90.9 resin, .5 colouring matter, 4 wax, and 2.8 gluten. Shell-lac is used for dyeing, and is shipped all the year round. At Calcutta the chief season is in December, January, and February. Very little is shipped during the south-west monsoons—March to September. It ought never to be stowed over castor oil or saltpetre on account of the evaporation ; indeed it should be placed at a considerable distance from castor oil to avoid impregnation of its noisome scent. Shell-lac is packed in teak (very similar to indigo cases), lined with thin oil cloth, weighing 150 to 200 lbs.

614. LAC DYE. Small square cakes of lac, which see. E.I. Co.'s ton 50 cubic feet ; a chest 4 cwt. Lac lake, a superior red lake. E.I. Co.'s ton 16 cwt. ; Bombay ton 50 cubic feet ; see lac.

615. LADEN. The state of a ship when she is charged with a weight or quantity of any sort of materials, proportionate to her tonnage or burthen. Laden in bulk ; laden with a loose cargo such as coal, salt, grain, &c.

616. LAMP BLACK, is a soot prepared by burning the dregs and coarser parts of tar in furnaces : the smoke is carried through tubes into boxes covered with linen upon which it settles. When recently made, it is liable to spontaneous combustion without the admixture of oil ; with oil the danger is imminent, whether recently made or otherwise. Agree for gross weight if possible, as the tares are very great. Bags of lamp black are represented as being useful to fill up, and from their lightness can be placed where some descriptions of goods will not answer. 20 hogsheads, weighing seven tons, or 120 bags six tons, occupy 850 cubic feet or 1 keel. When wheat is 1s. $\frac{1}{4}$ quarter freight, lamp black is rated at 4s. 10 $\frac{1}{4}$ d. $\frac{1}{4}$ hogshead and 9 $\frac{1}{4}$ d. $\frac{1}{4}$ bag.

617. LANDING GOODS. The landing of the goods upon the wharf is a sufficient delivery, if due notice be given to the parties who are to receive them, and the delivery takes place on a legal working day, such working day being a working day in the country or place at which the goods are delivered. The master is not, how-

ever, bound to deliver until the freight due is paid or secured to his satisfaction, as he has a lien upon the goods for his freight ; but the consignee can require the goods to be taken from the hold, in order that he may examine them before paying freight. In such case they should not go out of the possession of the master or his agents. Where no one will become responsible a master may deliver a bag, bale, or ton, as the case may be, and be paid freight thereon before he delivers more. At the London and other docks and wharves the ship's brokers send a printed notice duly signed, to stop all goods for freight ; they are retained by the Company until the broker sends a release or a person authorized to take off the stop ;" see the article delivery.

618. **Sundays.** By 16 and 17 Vic., chap. 107, sec. 49, no goods, except diamonds, bullion, lobsters, and fresh fish are to be unshipped or landed on Sundays or holidays, or on any other day except between the hours eight a.m. and four p.m. from 1st March to 1st November ; and between nine a.m. and four p.m. from 1st November to 1st March (except free goods), unless special leave be obtained from the Custom-house. The goods are liable to forfeiture unless removed in the presence and with the authority of the officer of the customs.

619. **Customs' hours.** Free goods are allowed to be landed from six a.m. to six p.m. from March to November. Although they pay no duty, goods are not considered free until examined by the customs and passed. Cattle are landed at any hour, day or night, if passed by a veterinary surgeon.

620. **LAPIS LAZULI**, or Ultramarine, a very fine blue powder, and a mineral of great value. E.I. Co.'s ton 20 cwt.

621. **LARD** (specific gravity 0.947), is often stowed to fill up breakages, by which heavy articles sometimes press on it and force out the heads of the kegs. It is much injured by salt-water, and should not be placed near guano, sugar, cotton, flour, wheat, &c. In steam ships keep well off from the bulkhead of the engine-room ; see butter, candles, general cargo, hams, &c.

Tonnage. Bengal and Madras ton 50 cubic feet. In computing the freight of kegs of lard at Baltimore, 200 lbs. net weight are considered equal to a barrel of 5 cubic feet.

622. **LAST** is a metrical term, of German origin, for a load. It is sometimes used to signify the burthen of a ship, and is applied to various uncertain quantities of merchandize, generally it is estimated at 4,000 lbs.

BRITISH AND FOREIGN LASTS.

BRITISH.—14 barrels of pitch, tar, or ashes, usually make a last; 12 barrels codfish, potash, or meal; 20 cades each of 1,000 herrings, every 1,000 ten hundred, and every 100 five score; 18 barrels unpacked herrings; 10,000 pilchards; 1,700 lbs. feathers; 17 cwt. flax; 12 sacks wool, 364 lbs. each; 20 dickers leather, every dicker 12 skins; 24 barrels gunpowder, each of 100 lbs. As a grain measure in England, the last usually consists of $10\frac{1}{2}$ quarters, 12 sacks or 4,363 lbs.; in some places 21 quarters; rape seed 2 loads or 10 quarters; cole seed $10\frac{1}{2}$ quarters.

DENMARK.— $47\frac{1}{2}$ bushels, 224 lbs. net, oil, butter, or herrings; $44\frac{1}{2}$ lasts=100 tons.

GERMANY.—*Lubeck*, a vessel of 162 tons register is $69\frac{1}{2}$ lasts; in calculating the navigation dues levied by the Senate of Lubeck, 2nd March, 1864, a last for sea-going and sharply-built vessels is 4,000 lbs.; flat-bottomed open vessels 5,000 lbs.; vessels plying between Lubeck and Schonberg 6,000 lb.; *Rostock*, 96 scheffels oats $14\frac{1}{2}$ quarters; other grain 14 quarters; *Bremerhaven*, 4,000 lb.; a ship-last of herrings or salt 12 barrels; coal 12 barrels or 2 chaldrons Newcastle; grain 80·70 bushels or 10·087 quarters; that is 10 quarters 0·7 bushels. A vessel of 450 tons is computed as 300 lasts, which make a Bremen last $1\frac{1}{2}$ tons; *Hamburg*, a commercial ship-last is equal to 3 tons or 6,000 lbs.; 10 lasts=108·8 quarters. The last is divided into 60 fuss.

HOLLAND.—*Amsterdam*, iron or copper, 4,000 lbs.; oats $5\frac{1}{2}$ bushels; ballast 2,000 lbs.; *Rotterdam*, for freight 8 oxh-olds wine, 5 pieces gin, 14 barrels herrings, 12 barrels pitch, 13 barrels tar, 4 casks olive oil, 7 casks whale oil, 20 cases oranges, 4,000 lbs. rice, 300 lbs. almonds, 2,000 lbs. wool, &c. For freight a last of wheat is 10 $\frac{1}{2}$ cent. higher than barley, and barley 20 $\frac{1}{2}$ cent. higher than oats.

NORWAY.—A last of herrings 2,224 lbs. English, 49 lasts=100 tons English.

PORTUGAL.—*Lisbon*, for freight 4 pipes of oil or wine, 4 chests sugar, 4,000 lbs. tobacco, 3,600 lbs. shumac.

PRUSSIA.—*Dantzic*, ship-lasts 4,124 lbs.—timber 80 cubic feet; grain 30 hecto-litres=85 bushels=2·66 tons; *Memel*, $3\frac{1}{2}$ malters corn, 60 scheffels, or 240 viertels, or 11 quarters 3 bushels English. For wheat, rye, &c., the last of $56\frac{1}{2}$ scheffels or 10 quarters, 7 bushels, is generally used; *Stettin*, 4,000 lb.; *Swinemunde*, 4,000 lbs.

RUSSIA.—In *St. Petersburg*, 120 poods of tallow make a last; 63 poods 1 ton English; see the article leather.

SPAIN.—*Malaga*, for freight 4 boats or 5 pipes wine or oil, 4 bales orange peel, 5 pipes Pedro Ximenes wine or oil, 10 casks almonds (each about 380 lbs. English), 20 chests lemons and oranges, 22 casks almonds (8 arrobas each), 44 casks raisins (4 arrobas each), 87 half-casks raisins, 50 baskets or 160 jars raisins. The arroba or cantara is equal to 4·19 wine gallons English.

623. **LAY-DAYS.** As a general rule lay-days mean running days, and include Sundays and fixed holidays; one exception being where the ship has reported too late for the merchant to begin discharging in fair time on Saturday, in which case the merchant would

be entitled to begin to count his lay-days from the following Monday, or first working day which the late reporting of the ship on Saturday gives the advantage of. The ship's days would then run on as running days; the succeeding Sundays and holidays counting as days against the merchant. Another exception sometimes allowed, is an alleged usage against merchants in London, holding the word days to count as working days. Lay-days, Sundays excepted, mean working days, Sundays of course not counting as days. Running lay-days mean that every day is to count, viz. : working days, Sundays, and holidays. Lay-days, subject to the exception stated above, are to be construed to count as running lay-days, and include working days, Sundays, and holidays; see demurrage and charter-party. *Lay-days allowed at the Port Adelaide Wharves*: all vessels under 100 tons are allowed six days for the purpose of discharging, and all vessels above 100 tons the following number of days, Sundays not included: vessels from 100 to 300 tons, 10 days; from 300 to 600 tons, 16 days; above 600, 21 days. Vessels discharging cargo have preference.

624. By article 274 of French Code of Commerce, it is enacted that when no time is fixed for loading and unloading by agreement, it shall be regulated by the custom of the port, acting on this it is the custom in some French ports not to count lay-days until the vessel is in her discharging berth, and not allow her to come into such berth until it suits the merchant.

625. **LEAD.** When pig lead only is taken, dunnage say with coal or rubble, until the keelson is completely covered, in order to raise the lead and make the ship easy at sea. Lay plank, and stow in the middle in stacks, by placing the pigs three or four inches apart, and crossing at the same distance. Large billet wood makes good dunnage, stowed between; see copper, hemp, and iron.

626. **Lead pipe** requires great care to prevent its being bruised. Stowed on a platform in sizes, coil on coil, the lesser inside the greater; the height of the stack will depend on the weight of the pipe per foot—the heavier the pipe the higher the stack. Coils are sometimes bound with twisted straw, or packed in casks with loose straw.

627. When stowing **sheet lead** with general cargo, it is usual to lay the rolls from the keelson towards the bilges, the upper rolls falling between those below, and so on; it should never be laid crossways. Sheet lead cut to size for lining tea chests and packed in small rolls, in boxes weighing about 60 lbs. has been rejected in Calcutta, because it was damaged and discoloured evidently by bilge water, although the surveyors' reports exonerated the ship from any

charge of bad stowage, &c. The hardness of these packages induces the stevedore labourers to drop them and work them in as bilge dunnage, under the impression that the lead would not hurt if it got wet; too much skilful supervision cannot be exercised in all such matters. Here may be classed boxes of **rifle bullets** which are shipped in packages of about one cwt. well nailed; they ought to be iron-banded. Masters and officers should be careful to prevent these boxes, when carried low in the hold, from being used in the wings to block off such packages as casks of hardware, &c. Stevedores have been known to use them even for chocking off hogsheads of beer; at the end of the passage the boxes have been found with their ends squeezed out, and the bullets have afterwards been shovelled up in bulk among the floor dunnage.

Tonnage. 300 pigs of lead, weighing 22 tons, will occupy a space of 283 cubic feet or one-third of a keel. A vessel of 203 tons register will stow 1,289 pigs of lead, weighing 902·7 tons, but she could only carry 435 pigs, weighing 304½ tons. E.I. Co.'s ton 20 cwt.; at Baltimore 2,240 lbs. When Mediterranean is 1s. 7d. quarter freight, lead is lifted at 4s. 9d. 7d. ton of 20 cwt.

Pipe, of ¾-inch bore, weighs 6, 7, or 8 lbs. per yard; 1-inch 7 to 11; 1½-inch 10½, 12 and 15 lbs.; 1¾-inch 14, 16, 18, and 21 lbs.; 1¾-inch 16 to 24 lbs.; and 2-inch 17½ to 24 lbs. per yard. Lead pipe, from 4 to 5-inch bore, is made in lengths of 10 to 15 feet; 2½-inch 30 to 36 lbs. per yard; 3-inch 36 to 42 lbs.; 3½-inch 45 to 50 lbs.; 4-inch 50 to 60 lbs.; 5-inch 70 to 80 lbs. per yard.

Sheet, 1-10th-inch thick, weighs 5·889 lbs. to a square foot; 1-9th-inch 6·554 lbs.; 1-8th-inch 7·373; 1-7th-inch 8·027 lbs.; 1-6th-inch 9·831 lbs.; 1-5th-inch 11·797 lbs. Sheet lead is made up in rolls 6½ to 7½ feet wide, and varies in length from 30 to 35 feet. A roll, 4 lbs. to the square foot, weighs 7 to 8 cwt.; 5 lbs. 10 to 11 cwt.; 6 lbs. 12 to 13; 7 lbs. 14 to 15; and 8 lbs. 16 to 17 cwt.

Sizes. A pig of lead is about 3 feet long, and weighs 1½ to 1¾ cwt. Spanish pigs are about 1 cwt. A fodder in London 19½ cwt. or 2·184 lbs., ordinarily 8 pigs Newcastle 21 cwt.; Stockton 22 cwt. A fotnal 70 lbs.

628. **LEADS**, red and white, in powder or mixed with oil, are shipped in casks 14 lbs. to 10 cwt., and are useful for stowage in some general cargoes, but not on light packages; see paint.

629. **LEATHER** should be stowed dry and kept clear of salt-water especially; a damp air alone will greatly injure it. Skivers, if shipped in a damp state, are liable to be damaged by heating during a voyage; see kid gloves. Russia juffs, red, white, and black, are packed in rolls, each containing 10 hides, and from 10 to 15 of these rolls are packed together in a bundle, well secured with thick matting. 20 dickers, every dicker 12 skins, make a last. 60 rolls of juffs make a last. 88 poods net weight, shipped for Italy make a last; and 44 poods a ton, in England.

630. LEMON PEEL is packed at Messina in pipes filled up with salt-water for conveyance to London, where it is either candied or used as a medicine. The schooner *Ulfida*, 139 tons register, stowed November, 1861, 32 pipes lemon peel and 2,000 cases of lemons. Messrs. THOMSON & Co., Italian Consulate, Leith, say 19th November, 1867, a vessel registering 218 tons, stowed in 1866, 415 pipes orange peel exclusive of boxes for broken stowage, which were carried freight free. When lemons are freighted at 2s. 9d. $\frac{1}{2}$ case, lemon peel obtains 17s. 6d. $\frac{1}{2}$ pipe.

631. LIGHTERS. Cargo should not be put into lighters unless the lighterman, or some one duly authorized, be there to receive it. The mate, or person delivering goods over side, should be careful to obtain a receipt from the lighterman, as this takes off the responsibility from the mate; then if any damage should occur the loss will fall upon the lighterman. Although the mate has performed his duty when the goods are over the side, yet if he put into the lighter without any authorised person to receive them, the loss will fall on the ship. Strict attention should be paid to the Overside Delivery Orders, that the goods may be delivered into the proper lighters. Lightermen have been held liable for damage to goods, by negligently making lighter fast to a steamer, so that the lighter, on the tide rising, got jammed under the steamer, and sunk. In the Common Pleas, 27th April, 1866, LANE, an underwriter, sued NIXON, owner of the *Queen of Beauty*, for the value of goods from Liverpool, lost in an unseaworthy lighter at Melbourne. The judges decided that the risk of discharge by lighters was within the insured voyage.

632. LIGHTNING. The terrible destructive agency of lightning has been peculiarly fatal in ships laden with cotton. There is perhaps no substance more inflammable, when exposed to the electrical spark, than cotton wool. Jute is also very open to inflammation by the electric spark, and since several ships laden with jute have been destroyed by fire, supposed to arise from spontaneous combustion, it is by no means improbable that combustion has arisen through electrical agency, since we have no evidence that jute itself is liable to take fire spontaneously. Formerly it was considered that the electric discharge glanced over those parts of the masts of ships which were covered with lamp black and tar, or painted with lamp black and oil, without the least injury, but shivered the uncoated parts in such a manner as to render the masts entirely useless, but this opinion does not prevail now to such an extent. It is by no means improbable that the conducting carbonaceous matter contained in the lamp black of the paint, enabled the lightning, in certain

cases quoted, to glance over the surface of the wood without entering its substance, it being demonstrable by physical experiments, that a mere line of water deposited upon the surface of glass, by means of a common pen, will enable a heavy and brilliant electrical spark to find its way over the non-conducting glass, without injury to its surface.

633. We are indebted to the late Sir SNOW HARRIS, F.R.S., for a physical and practical elucidation of this important question, more especially as relates to the preservation of shipping generally. Casting aside a prevailing prejudice of the day, as being contrary to all inductive philosophy, that metals by a specific attractive influence on the matter of lightning, draw down from the clouds the very destruction they are set up to avoid, he arrives at the conclusion, that in order to effectually secure ships with their cargoes of whatever consisting, from the fury of the electrical discharge, it is requisite to bring the whole mass into that comparatively passive or non-resisting state it would assume relative to the electrical discharge, supposing the whole continuously conducted. This he effects, by rendering the masts themselves, efficient conductors, and linking these conductors, by means of metallic connection, into one great chain with the metal bolts or other metals passing through the keel or sides of the ship, so that from the instant of a stroke of lightning falling upon any point of the vessel, either below or aloft, the electrical discharge would meet with no impediment in finding its way to the sea, without intermediate explosion so fatal to ships laden with cotton, wool, or other inflammable matter. These principles have been practically and universally carried out with the most perfect success in ships of the royal navy, as also in very many vessels of the merchant navy, including steam ships. The great end to be kept in view in stowing a ship's cargo, more especially when consisting of an inflammable material, such as cotton wool, is to avoid all intermediate explosion in the case of a stroke of lightning finding its way through the hull into the sea.

634. LIME (BORATE OF) is shipped in small quantities all the year round at Iquique, Mexilones, and Pisagua.

635. LINENS. See Baltic and Archangel rates of freight at the commencement of this work. A Russian archeen 28 inches.

636. LIQUIDS should be stowed at a distance from guano, coal, grain, flour, rice, valonia, fruit, and other goods liable to generate heat, or leakage will inevitably ensue. Stow beer and porter on the floor; oils and molasses in the wings; and spirits and wine on the top of that part of the cargo not liable to be damaged

by the breaking of the casks ; and endeavour to keep all your liquids, of whatever kind, as much in one part of the ship as possible ; to have good cross beds at the quarters, and not trust to hanging beds ; to be well chocked with wood, and allowed to stow three heights of pipes or butts, four of puncheons, and six of hogsheads or half puncheons. All with their bungs up. If not a full cargo, stow the liquids at each end. Casks in the 'tween decks, are recommended to be stowed a-burton or athwart ships ; if end on they may by the motion of the ship, get slewed bung down, and thus be liable to leak ; see molasses. Casks should be sounded by an authorized cooper previous to breaking out ; if properly stowed the loss falls on the underwriters ; if not it falls on the ship. In **Sydney** it has been settled by arbitration that if a cask, hogshead, &c., of ale or other liquor liable to ferment on the voyage out, is found empty or partly so through the lifting of the head, &c., by fermentation, the ship is not liable even if the head burst in transit from her to the wharf. A master who has conveyed goods from London to the East Indies, says—that bottled ales and beer packed in casks and stowed in a hold with other goods, are frequently damaged, in consequence of the insecure character of the cask hoops. He thinks that the hoops should be flat, similar to those on household flour barrels, and not like those on herring casks. TENNANT'S bottled beer is always packed in barrels for the East Indies. He thinks that bottled ales are best in strong cases, which can also be stowed more advantageously. A merchant experienced in casks, says—"I have no doubt flat hoops (ash) are more durable, but they are considered too expensive. Government uses only good tough ash hoops on powder casks. Hoops are generally of withey, birch, hazel, and of almost all the classes of small wood found in copses ; these are very perishable, especially in a close hold where a cask will be decomposed in three years, while in a properly ventilated store it might last half a century. Water casks should never be painted for use below deck, or they will rot. In the whaling trade oil is poured in boiling hot, which tends to destroy the casks. Wooden casks are said to be better for stowing biscuit than iron tanks, because the wood absorbs the dampness from the bread. Zinc hoops are less liable to rust, but are sometimes not so strong as iron hoops."

637. Liquids, such as castor oil packed in tins, leak occasionally from the sea-water having acted on the soldering of the cases, and sometimes having corroded the tin-plate itself. A fire occurring in a ship will account for excessive leakage both from casks and tins, though it may not have touched them ; see casks, oils, wastage,

general cargo, spirits, &c. Castor oil cases at Calcutta generally leak, and as they will not bear much pressure they are generally stowed right forward in the eye of the vessel.

638. **Ullage.** The liability of all liquids to lose by ullage proceeding from the casks leaking, even where no specific injury has happened, is so notorious that it makes claims on liquids difficult to settle with underwriters. Some of the latter even maintain they are not liable in respect of loss of liquids. This is a clear mistake; and unless they insert the warranty which exists in several East Indian policies, excepting loss on liquids, they are not exempt. But as ullage or leakage is of so common occurrence, it requires very clear and definite evidence that there was violence, or some real cause of loss, and not the result of faulty or unseasoned packages; neither that it arose from imperfect quoining and stowage. It is necessary to show by the protest, that at some period an undue and accidental pressure was exerted. The disturbance of the stowage by a ship being thrown on her beam ends, or by striking the ground suddenly, is sufficient to account for pressure and consequent loss. But even when a claim is established, the ordinary loss by ullage should be deducted. The law does not countenance the "usage of LLOYD'S" against underwriters' general liability. In one instance, when it appeared that oil had been lost by leakage, caused by violent labouring in a cross sea, Lord DENMAN refused to admit evidence of a usage of LLOYD'S that unless the cargo was shifted, or the casks damaged, underwriters were not liable for any extent of leakage, however caused, as a loss by the perils of the seas. His lordship told the jury to consider whether in their opinion the damage to the oil was caused by the perils of the seas, and said, "It may be very convenient for the underwriters to have such a general rule, and for the commercial world to submit to it; but if they mean thereby to control the effect of a plain instrument, they should introduce its terms into the policy." *Hopkins on Average.*

Tonnage. E.I. Co. allows for freight 210 imperial gallons, one-fourth more for covered casks, one-fifth off measurement of casks for bulge. At New York and Baltimore, 200 gallons wine measure, reckoning the full contents of the casks, of oil, wine, brandy, or any kind of liquors.

639. **LIQUORICE**; a cask of juice $1\frac{1}{4}$ cwt. nearly; a case of roots shipped at Naples weighs about 2 cwt., and measures nearly 10 cubic feet.

640. **LIVERPOOL DOCKS.** The master porters' prices for unloading in 1856, were—a general cargo of 750 tons Calcutta, about £20; China tea £16 to £18; cotton (U.S.) 12s. 6d. 100 bales; guano 6d. 6d. per ton.

641. **LOADING.** In reference to clearing one end first, Capt. SEDGWICK says; this practice cannot be too strongly condemned; it is lubberly, injurious to the vessel, and can only be pardonable when there is a leak to stop, or copper to be mended. The weight should be kept amidships, and cargo put into the fore and after holds. Should she be unusually crank, and require much cargo to stiffen her, before that which is left amidships, can be removed, then it would be prudent before all the weight is taken out, to let the cargo

put into each end, meet at the main hatchway to avoid having too much at either end. A little attention to these matters shows the intelligent officer; but the man who points either the head or stern to the clouds, may depend that he is inflicting an eyesore on every seaman in the port.

642. Over Loading. If over loaded the Board of Trade may detain ship and order her to lighten. If any foreign vessel take in cargo in any part of the United Kingdom, the Board of Trade may compel them to lighten before going to sea. When vessels have to lighten, the following table, shewing the tons weight in one-inch immersion will be found useful, viz:—multiply the registered length, breadth, and depth together, then if the vessel be a full-built ship, divide the product by '8; if clipper or steam vessel by '65; if a yacht above 60 tons by '5; small by '45. The remainder, after thus dividing, will be the tons weight per inch at the load-line. For light-water line deduct 10 $\frac{1}{2}$ cent. for load-line.

LOADING AND UNLOADING AT HAVRE.

SAILING VESSELS.					STEAMERS.				
Of	tons	unloading	loading.		Of	tons	unloading	loading.	
	150 and under	2 days	3 days			150 and under	5 days	3 days	
151 to	300	4	5	„	151 to	300	6	10	„
301	500	6	7	„	301	500	9	17	„
501	750	8	8	„	501	750	11	20	„
751	1,000	10	11	„	751	1,000	12	23	„
1,001	1,250	12	13	„	1,001	1,250	15	25	„
1,251	1,500	14	15	„	1,251	1,500	17	27	„
1,501 and above		16	17	„	1,501 and above		20	30	„

LOADING AND UNLOADING VESSELS AT DUNKIRK.

Sundays and holidays included.

This time counts from the day on which the vessel has been placed in a position to commence her loading or unloading, viz:—

DAYS.					DAYS.				
A vessel above	100 to 125 tons	6			A vessel above	400 to 450 tons	14		
„	125 150	7			„	450 500	15		
„	150 175	8			„	500 575	16		
„	175 200	9			„	575 650	17		
„	200 250	10			„	650 725	18		
„	250 300	11			„	725 800	19		
„	300 350	12			„	800 875	20		
„	350 400	13			„	875 950	21		

48 hours are allowed above the time of unloading, to finish to take away the goods. 24 hours are allowed above the time of unloading, to vessels which will be in want of taking ballast to stiffen them, after they are discharged. The Harbour Master has the power of prolonging the time.

643. At **Havre**, in 1868, new regulations were published. The time to be allowed for unloading and loading vessels, is as follows :—

VESSELS.	SAILING VESSELS.		STEAMERS.	
	Unloading.	Loading.	Unloading.	Loading.
	days.	days.	days.	days.
150 tons and under	2	3	5	10
151 to 300 tons	4	5	7	14
301 to 500 tons	6	7	9	17
501 to 750 tons	8	9	11	20
751 to 1,000 tons	10	11	12	23
1,001 to 1,250 tons	12	13	15	25
1,251 to 1,500 tons	14	15	17	27
1,501 and upwards	16	17	20	30

As to fires and lights, the former can only be used in sailing vessels and steamers from eight in the morning to five in the afternoon in winter, and from five a.m. to eight p.m. in the summer. Lights to be extinguished at latest at eight p.m. in winter and nine in summer. For steamers leaving at day-break, fires may be lighted three hours before departure ; see lay-days.

644. **Port Jackson.** *Time allowed for discharging.* Vessels lying at any public wharf are exempt from the payment of tonnage rates during the following number of days, Sundays not included :—100 to 200 tons, 12 days ; 200 to 300 tons, 16 days ; 300 to 400 tons, 20 days ; 400 to 500 tons, 24 days ; above 500 tons, 35 days ; but after the expiration of the above period, payment shall be made at the rate of $\frac{1}{4}d.$ \pounds register ton \pounds diem on all vessels loading, unloading, or refitting at any public wharf. Stevedore's charges for pressing and stowing wool 4s. 6d. \pounds bale.

645. **Loading by Turn.** The *Shipping Gazette* of March 7th, 1867, says :—There are few questions of a practical nature relating to shipping business, especially in the coal trade, more important than that comprehended in the phrase "loading by turn." Taken in its broad and obvious signification, it means the loading of ships as they arrive at the loading ports, without reference to the tonnage, character or adaptation to the local facilities possessed by the trade of the place. This elementary meaning of the term is, however, varied in practice to a considerable extent, and may, of course, be varied indefinitely by conditions inserted in contracts of affreightment entered into by owners and charterers. The rule of law is that evidence of custom is admissible to explain a contract, but does not overrule it : and there are few points upon which evidence of custom

is more valuable than in this one of the meaning attached to the term "loading by turn" as it is accepted in the coal trade. Our impression of Tuesday contained the report of a trial, a day or two since, before the Judge of Assize at Durham, the proceedings in which, and the result, although it may not be final, are worthy of attentive consideration. It was an action brought by Mr. HELMKEN, as owner of a ship named the *Cedar*, against Messrs. SCHUNK & Co., of Sunderland, for demurrage. The *Cedar* had been chartered to proceed from Bremen to Sunderland to take in a cargo of coal, and to load in turn. The charter did not specify any particular kind of coal, nor was there any stipulation as to loading, beyond the general one that the ship should be loaded in the "customary manner." The *Cedar* arrived in Sunderland on the 5th of September, 1865, and reported next day; and, according to the statement of the plaintiff—which does not appear to have been disturbed—although the coals were repeatedly applied for, the vessel was not loaded until the 30th. For this delay demurrage was claimed at £6 ¹/₂ day. For the defendants it was urged that the merchant had the option of choosing a particular kind of coal, in which case the ship would have to wait her turn till other ships coming before her had received their cargoes. After a lengthened discussion, the learned Judge told the jury that the verdict would turn upon the answer they might give to two questions:—"First [said his "lordship] by the usage of the port of Sunderland, in the case of a "ship chartered to load coal generally without specific description of "coal, do the words 'load in turn in customary manner' mean loading "with reasonable dispatch when the ship is ready, and after notice of "the ship's readiness to load and without reference to any turn "established by the agents of any particular colliery? If that question "were answered in the affirmative, they would give the plaintiff £6 "a day for detention beyond a reasonable time. The other question "was—By the usage of the port of Sunderland, in the case of a char- "ter-party to load coal without a specific description, do the words "'load in turn in customary manner' mean, if the merchant elect, "after his arrival, to load from a particular colliery—do they mean "load in their turn at the spout of that colliery according to the order "of their arrival at port, being ready to load as the order arrives? "If to that question the answer was 'yes' then they would give a "verdict for the defendants." The jury, having duly considered these questions, found for the plaintiff, with £60 damages.

646. This finding is of especial value, because it has been arrived at by a jury thoroughly acquainted with the usages of the northern coal ports, and, therefore, every way qualified to decide upon the

point at issue ; but were this otherwise, it seems repugnant to common sense, as it is at variance with the principle on which demurrage claims rest and have been upheld, that a ship should remain at the order and disposition of the charterers or their agents until it suits the convenience of the latter to find the cargo. To "**load in turn,**" in the opinion of a Durham jury, means to load with reasonable dispatch, on notice being given of the ship's readiness to take her cargo ; and "reasonable dispatch" means the ordinary dispatch given to coal ships at the port of Sunderland. To load coal of a specific description has nothing to do with this usage ; and if the charterers desired to do so, they should have made it a matter of express stipulation in the charter-party. Without such a stipulation it was assuredly not competent for the charterer to detain the ship in order to load a particular description of coal, and if he did so, he had no answer to the owner's claim for demurrage. It is satisfactory to find a jury of practical men, who must be regarded as authority on such a question, coming to a decision not only conformable to the common sense view of the case, but with the principle of law which governs demurrage. We do not for a moment say that the defendants, in disputing the plaintiff's claim, did not believe they had a right to detain the plaintiff's ship to load a particular cargo. It was clear, however, that, in the absence of express stipulation, they had not. The difference between the parties to this action might have been effectually obviated by the insertion in the charter of a very simple condition ; and we may add, it is a neglect of such and obvious precaution that is the direct cause of nine-tenths of the litigation which arises upon charter-parties. "Usually (say the authorities) the "contract of affreightment fixes the number of lay days, and the "number of days for the ship on demurrage. But if it omit to "ascertain the former, the law implies a stipulation for reasonable "time considered with reference to the trade and the port the vessel "is in ; and this will include such increased delay as is consequent "upon discharging a cargo into a bonded warehouse at a port like "London. The law will then imply, if need be, a *contract or covenant* "not to detain the ship longer than such reasonable or fixed time for "loading or discharging, or longer than the time fixed for demurrage, "entitling the owner to reasonable damages for such detention, "notwithstanding it is occasioned by the crowded state of the docks, "the state of the weather, the non-production by the defendant of "landing papers, or the non-arrival of the bill of lading—in fact "*whenever the detention is not attributable to the shipowner or his agents.*" Such is the view taken by our Courts on Law on demurrage claims,

where those claims are not waived by an express stipulation between the parties to the contract of affreightment.

647. Before the judge of assizes at Durham, in April, 1867, Mr. HELMKEN, owner of the *Cedar*, brought an action against Messrs. SCHUNK, of Sunderland, for demurrage. The ship was chartered to load in turn without specifying any kind of coal. She arrived 5th September, 1865, was reported next day, but not loaded until the 30th. Defendant urged that he had the option of choosing a particular kind of coal, but the jury awarded £60, or £6 daily for ten days.

648. LOCUST BEANS. A master addresses the *Shipping Gazette*, 5th June, 1857: "My vessel was chartered at 35s. for oil, other goods in proportion; she is full with 127 tons of locust beans, but has discharged 146 tuns of oil. At what rate am I to be paid for the locust beans, which are not in the table, and ought I not to have the same freight as if loaded with oil?" Answer: "although the locust beans are not in the rates, yet they are included under the headings grain, seed, &c., as paying 10 $\frac{1}{2}$ cent. more freight in proportion to weight than wheat. It is, however, certain that locust beans were not considered when the present Mediterranean rates were adjusted, and, therefore, were not intended to be included under the head of 'beans.' The fairest mode of settlement is to pay as for an oil cargo; otherwise to go to arbitration."

649. The Danish brigantine *Talk Harrid*, Capt. DYB-DHAL, loaded locust beans at Villa Nova, Portugal, in March, 1864. She registers 144 tons English, 75 lasts Danish, and measures, in Danish feet, about 90 feet long, 22 broad, and 9 ft. 9 in. deep. Usually vessels cannot stow of locust beans, more than from three to five per cent. under their register, but as her cabin and fore-castle are on the brigantine's deck, she took in 147 tons of locust beans, which is three over her register tonnage. The dunnage consisted of some deal ends covered with mats. On the reception of every fifteen ton, four men were actively employed rolling two casks full of water over the cargo to press it down. The locust beans were weighed into baskets; 1,000 kilos to the ton. **Port charges** for the brigantine, including pilotage, about £5 10s. With the bean cargo the brigantine drew 9 feet 9 inches on an even keel; with 220 tons Shields' steam coal she drew 10 feet 6 inches fore and aft; the hold was then about five-sixths full. The brigantine is flat-bottomed. A ship which can shift without ballast need not take ballast with locust beans. At Villa Nova the crop is gathered in September and October, but shipments take place all the year round.

650. LOG BOOK ; see manifest, master, protest, survey, &c.

651. LOGWOOD, the coloured wood of an American tree. If cut in the hold, remove the sawdust, which, when wet will seriously injure other goods, sugar especially. It is exported from the West Indies and Central America. An owner chartered his ship for West India produce, "calculating that she would obtain sugars and molasses, for which the terms were favourable." She was laden with logwood and made an insufficient return ; nevertheless logwood is the produce of the West Indies. New York ton 20 cwt., Baltimore 2,240 lbs.

652. LUCIFER MATCHES should be kept dry ; they will spoil if stowed near bales of bacon, &c., or sand, salt-water sand especially ; their vapour will be absorbed by and injure other goods. For Australia they should be in tin or zinc cases tightly soldered, and ought, if possible, to be stowed on the top near a hatchway, to prevent unnecessary pressure, and to have them easily got at in case of accidental combustion. Some underwriters decline to insure lucifers if stowed in the hold, and the Admiralty will not allow them to be shipped in any vessel wholly or partially chartered by government. Use great care in moving, as they will ignite through a sudden jerk ; this has occurred when merely turning over a large packet and allowing it to fall smartly, instead of easing it down. On the 30th August, 1862, a large case of lucifers (shipped as fusees or matches), which was on the deck of the screw steamer *Oscar*, Capt. CRAIG, lying at Irongate wharf, London, took fire. Smoke was observed rising, and on the crew endeavouring to throw the case overboard the bottom dropped out, and the whole of the contents were quickly in flames. Ropes were got round the sides, and after some short delay the burning mass was hauled over into the river. It is supposed that the cask was let down the shoot from the wharf suddenly, and that the concussion against the deck caused ignition, although the fire did not break out for half-an-hour afterwards ; see vesuvians, in the article dangerous goods.

653. Amongst the cargo landed in November, 1864, at Reigate, from the wreck of the Spanish ship *Torre del Oro*, was a wooden case about three feet square marked BD 1104 ; inside this was a tin case containing patent leather. On opening the wooden case there was discovered between the tin and the wood some thousands of loose lucifer matches. There was also landed from the vessel a quantity of fancy baskets, one of which was filled with loose matches. These goods happened to be stowed in the midst of demijohns of spirits which were packed in a large quantity of straw. As the least

friction would have ignited the lucifers, it is very evident that in that case the ship and cargo would have been destroyed by fire, and in all probability the lives of all on board would have been sacrificed.

654. **Vesuvians.** *BURNS & MACIVER v. HUTCHINSON.* Glasgow, 3rd October, 1865. Complainants owned the steam-ship *Buffalo*, trading between Glasgow and Belfast, on board which a parcel was placed by the defendant. When hoisting it out of the hold at Belfast it ignited suddenly, and the fire took some time to extinguish. It contained vesuvians and fuses; contents were not marked outside, and no notice had been served on the master. The sheriff thought it necessary to have witnesses of a scientific character to prove that the materials of which vesuvians consist were necessarily of an inflammable nature, and the case was adjourned to the 10th, when Dr. PENNY stated that the component parts were phosphorous, saltpetre, chlorate of potash, charcoal and powdered glass. Articles thus composed were highly inflammable; if not properly packed they would be liable to explode by friction caused by the rolling of the vessel. They are more dangerous than gunpowder, which does not explode by friction. They would ignite at a temperature of 276°, while gunpowder would require 600°. In giving judgment the sheriff said that if the parcel had been marked "matches," as was contended by the defendant, it would not have been enough; it might be matches not of a dangerous and inflammable nature. The words "inflammable" or "highly inflammable and dangerous" should have been put on it. Fined £5 and costs.

655. **LUMBER** should be closely stowed, so as not to be moved by the rolling of the vessel; it frequently happens when this is neglected that the lumber sags to leeward when the vessel first goes to sea, and gives her a heel that way. Great care should be taken in stowing deck loads to see that they are well chocked and secured down, for if the lumber gets loose, the lives of the crew, as well as the safety of the vessel and cargo, will be endangered. From Singapore to Australia lumber is not considered a profitable cargo.

656. **LUMP LAC**; see the article lac.

657. **MACE** comes chiefly from Penang and Singapore; in the East Indies it is packed in bags containing 100 lbs. It is shipped all the year round, requires careful stowage, and is useful for beam fillings. Exhalations from saltpetre, castor oil, &c., injures it, and one mat at least should protect it from other kinds of cargo. East India ton 50 cubic feet, in cases.

658. **MACHINERY** should be placed in the vessel prior to any other part of the cargo, on account of its great weight, and to afford the opportunity of securing the several pieces properly, by beds and chocks made purposely. Such articles as cog-wheels and castings of a similar shape, should be lashed vertically or edgewise to the masts or stanchions, taking care subsequently to chock them on each side with rough cases of goods, well dunnaged. Where a boiler

or any similar article is, *upon an extreme emergency*, carried on deck, it should be placed in beds and chocks, as near the centre as circumstances will admit, resting upon the beams, which should be shored, to prevent the weight from injuring the deck. If two are shipped, they are generally secured on opposite sides, by means of lashings to the ring-bolts and by cross lashings to each other. For long voyages, vessels are selected having hatchways purposely constructed for enlarging. Some owners insist on having boilers placed in the main hold. Examine the slings, hooks, and rings, and see that the chains used are, by scale, well able to bear the weight; see rope and magnetism. In discharging very heavy machinery, it may be necessary to follow it up as it leaves the hold with pieces of timber or planks, so placed that in the event of the lifting tackle giving way, the fall shall be confined to a few inches. Similar precaution may be necessary when receiving such articles. In chartering for freight of engines, boilers, or machinery of any kind, a master should ascertain whether it should be rated at per ton of 20 cwt. or of 40 cubic feet, according to its description.

659. Capt. SEDGWICK says, the best way to get heavy machinery out is to cant the main yard a little; untruss, and lash it to the main mast; have a spare spar with a piece of plank under the heel, for a shore from the deck, lashed to the yard, about a foot inside where the foot tackle comes. Over the main hatchway a pair of sheers should be rigged with planks under the heels, which should be on the beam before the main hatchway; the beams require to be well shored in the 'tween decks. According to the size of sheers and strength of purchase, almost any weight can thus be lifted; and he recommends young officers, when getting out heavy machinery, to use the yard tackle over the hatchway as well as the other, in case of accident; and in lowering over the side, to use the tackle on the sheers to lower with as well as the yard tackle.

660. **Bricks.** In the Vice Chancellor's Court, *GOSSETT v. MELHUISE*: defendants sought to have the chief clerk's certificate varied. The suit was by a part owner of the *Matilda Wattenbach*, against the defendants, also part owners, and acting as the ship's husband. In taking the accounts, the chief clerk had charged the defendants, Messrs. MELHUISE, with the freight of 33,000 bricks which had been shipped from Jersey, and taken to Sydney, on account of Messrs. MELHUISE. It was contended on the part of the defendants, that they were not properly chargeable with this freight, on the ground that the bricks had been broken and destroyed by heavy machinery, which had been allowed to rest on them. On arrival at Sydney, the bricks were not delivered to the consignee, and no freight was paid; but they remained in the hold, and were taken to Calcutta, where they were sold for a very small sum. The vice chancellor thought that the freight was payable, and that the injury to the goods was the subject for a

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separate action; the chief clerk's conclusion was right, and the motion must be dismissed with costs.

661. **Cylinders.** Court of Exchequer, 19th December, 1864, *CAWTHORNE v. BURT*. This was an action to recover damages for not loading in pursuance of the terms of a charter-party. Plaintiff was owner and master. Defendant is a timber merchant. On 7th October, 1864, plaintiff entered into a charter-party with defendant to proceed with the sloop *Hey Dick* to King's Ferry, Queensborough, to load two cylinders and a tank, the measurement of which had been previously given, and it was alleged that on these the contract had been made. At King's Ferry, plaintiff saw Hall, an agent of defendant, and said he was ready to load. The next day he measured the cylinders, and found that their size exceeded the quantities given. The broker said he might take a portion, and they could send the remainder by another vessel. He, however, declined, unless they would guarantee that he should take the whole. Defendant's people subsequently attempted to load, and plaintiff lent them gear. The size of the cylinders produced such a strain on the mast that plaintiff told the men that if it was injured he should hold their employers responsible. Mr. HALL treated this as a refusal, and directed the men to desist. Plaintiff afterwards requested defendant to carry out his contract, but he declined, on the ground that plaintiff had himself exonerated him from its performance. It was sworn that had the cylinders corresponded with the measurements they might have been easily shipped. Defendants on the other hand, proved that the measurements had been given to the plaintiff; and, on his assurance that his vessel was quite capable, the charter-party was signed. On arrival at King's Ferry, the sloop was found quite unfit to take the goods on board in their then state and it was agreed that the cylinders should be cut into four pieces. After they had commenced to load, the plaintiff said they should not be allowed to proceed, unless they would give a guarantee for all the damage that might be done. The superintendent then stopped the loading, and the goods were forwarded by another vessel; verdict for plaintiff, damages £45.

662. **MADDER.** (French *garance*) is the root of a plant, the *rubia tinctorum*, which yields a fine bright red colour; the bones of animals fed on it becomes tinged with red. It is much cultivated in Holland, France, and Italy; it thrives in the north of Greece, grows wild in the Ionian islands, and is found at Kurdarnoon, Cyprus, and Smyrna, whence it is exported largely. In South America it grows wild also. There are two varieties the *rubia cordifolia* and the *rubia peregrina*. The last is cultivated in the south of Europe, and comes to England chiefly from the Levant. The roots are wiry and very much branched, of a red colour externally and yellow within; the best are those of the size of a writing quill, or at most the little finger. The woody portion is used chiefly in dyeing; the stringy filaments and epidermis, called *mulle*, are usually removed. The pith and bark are comparatively of little value. In warm climates madder roots are dried in the open air; elsewhere in stoves. This mode is adopted on the Rhone, after which they are thrashed with a flail, passed through fanners, and ultimately through brass sieves

having meshes of various sizes ; the coarsest is of the best quality. The small quantities of madder *roots* which arrives in London comes chiefly from Bombay ; very few bales of Turkish madder enter the Thames ; the great market is Liverpool. Bombay and Turkish madders seldom or never come to England in a ground state. Dunnage 9 inches with 2½ inches in the sides ; madder roots must be kept dry, they attract dampness from the atmosphere which injures them, and will create leakage from liquids in casks if placed near ; they may be stowed on but not mixed with valonia.

663. Messrs. JOLY & Co., under date **Smyrna**, 8th December, 1867, say, all madder roots go by steamers to Liverpool ; those for Glasgow being forwarded thence at ship's expense and shipper's risk for an extra freight of 7s. 6d. $\frac{1}{2}$ ton. The roots are sent alongside the steamers free of expense to the vessel, and are freighted per ton of 40 cubic feet, say 20s. to 30s. The bales, when hydraulically pressed, measure about 30.9 cubic feet, and weigh 6½ cwt. each. The cost of pressing (20s. $\frac{1}{2}$ ton of 20 cwt.) is paid by the shippers. Formerly the freight by sailing vessels was per ton of 20 cwt., and all expenses were paid by the ship.

664. At **Naples**, the compressed bales are said to be about 4 cwt. each, and are iron banded ; of these an ordinary carrying ship will take her register tonnage.

665. In **Holland** there are several qualities. The finest crop is " called "crop madder," it weighs heaviest ; the next is " little crop," then Ombro, Gamenes, and Mull's ; the last named, the commonest, is very light, being the last grinding, and may be compared as flour is to bran. Nearly all Dutch madders are exported in coarse powder ; this is the kind chiefly imported into London. A large cask of the finest ground madder measuring 4 feet 4 inches high, 11 feet circumference, and 32 inches across the head, weighed gross 15 cwt. 0 qr. 4 lbs. ; casks vary from this down to 5 or 6 cwt. ; casks are estimated to weigh 10 $\frac{1}{2}$ cent. of the gross weight. In 1867 the rate of freight from Rotterdam, by steamer to London, was 10s. $\frac{1}{2}$ ton gross, with 15 $\frac{1}{2}$ cent. primage. Madder flour quickly imbibes moisture, and fermentation spoils its colour. **Garancine** is madder treated with sulphuric acid ; the finest qualities are prepared in France, and very little is imported into London.

Tonnage. Bombay ton 14 cwt. When Mediterranean wheat is freighted at 1s. $\frac{1}{2}$ quarter, ground madder in casks is rated at 7s. 10d. $\frac{1}{2}$ ton of 20 cwt. Madder roots in hydraulic compressed bales pay the same freight as ground madder in casks. Loose in bales, pay one-third more than those in hydraulic compressed bales. Madder flour (garancine) pays 10 $\frac{1}{2}$ cent. more than ground madder in casks.

MADRAS—A BOAT LOAD.

The following articles, by weight or measurement, are computed at two tons to a Boat-Load.

☞ The first column of figures shows the quantity which is to be taken in "Fair weather;" the second column in "Foul weather or high surf."

Benjamin .. boxes	25	20	small	Gunny	12	small
— bundles	60			Gunpowder barls.	25	100 lb. ea
— chests	12		half	—	30	60 lb. ea
Biscuits .....bags	30			Gallingale bundles	25	
Boat oars .....No.	100			Gin .....cases	30	
Boots & shoes cases	8	6	small	Gun carriage No.	1	with whls
—			large	Ginger, dry ..bags	30	& 3 to 4
Butts .....No.	3	2		Hay.....bales	8	6 pounds
Broad cloth bales	8	6	large	Horns .....No.	1000	
—	10	8	middling	Hogsheads	6	4
—	12	10	small	Hams	120	
Buttons .....cases	6	4		Indigo .....chests	8	whole
Beef .....tierces	8			—	12	half
— hogsheads	6			Leaguers .....No.	2	
Carriage .....No.	1			Nankcen .....boxes	20	
Cotton screwd. bal.	8		300 lbs. ea.	Nuts .....bags	30	
—	10		250 "	Pickle, Europe lxs.	30	20
—	12		150 "	Palanquin.....No.	1	
Cotton, loose bags	16			Piece goods bales	6	3 lar. for
Codjoor nuts bun.	10	8		—	8	4 sm. China
Cocoanuts .....No.	1000		with husks	Pumpkins .....No.	100	large
—	1500		without	—	250	small
— ..bags	25		small	Puncheons	4	3
—	20		large	Pipes	3	2
Chests .....No.	4	3	12 dozen	Pipes, half	6	4
Chests, half	8	6	6 dozen	Pork .....tierces	8	
Canvas .....bales	4	3	20 bolts ea.	— casks	8	6
Clothing	8	6	3 corges ea	Pepper .....bags	35	25
—	10	8	2 "			
—	12	10	1 "			
Cheacoy ...bundles	20	15		{ Articles...No.	12	10 large
Chillies	20	15		—	20	small
Choya root	6		large	Bindoo plank	25	
—	8		small	Chittagong ...	25	20
Cochineal ...boxes	12	10		Duggies	1	lar. ship-
Cinnamon ...bags	35	30		—	2	sm. ping
Camphor ...boxes	12			—	8	lar. land-
Cloves .....bags	40			—	12	sm. ing
Curry stuff seeds	25	20	80 lbs. ea.	Mango.....	20	landing
Dates	35	25	Ramiapatam	—	10	shipping
— tons	2	1½	Bombay	Shim Beams .	20	landing
Drugs .....bags	12	10	when pack	—	8	shipping
Eating leaves bun.	40		ages are	Spars	1	large
Flour .....casks	8	6	various	—	4	small
Grain { Ramiapatam .	20		shipping	Rattans	250	100 in bun
— bags	25		landing	—	500	50 dle
— Bengal	25		shipping	Reapers	60	10
—	30	25	landing	Saddlery .....cases	8	6
Glass ware chests	6		whole	Shark's fins bndls.	3	
Glass ware chests	12		half	Sheathing } No.	100	double
Gunny ...bundles	6		large	boards }	150	single
				Soapnut .....bags	30	
				Spices of all sorts	10	large

Spices of all sorts	20	small	Sugar	6	Bengal
Stationery ...cases	6	4	— small		China
Staves .....packs	20		— packages	40	
Stick lac .....bags	30		Sugar candy tubs	25	
— bundles	40		— $\frac{1}{2}$ tubs	50	
Sugar .....casks	4		Tents .. sets	6	private
— lumps	50	large	Tamarind ...bags	15	two-pol'd
— ...	70	small	— bags	20	Bengal
— canisters	6	Batavia	Thread ...bundles	7	6
— bags	20	Bengal	Tobacco .....bags	30	

DEAD-WEIGHT.*Computed at $1\frac{1}{2}$ tons per Boat-Load.*

Anchors No.	1	12 cwt. —	Nails	1 $\frac{1}{2}$	
		sm. grap-	Red lead	1 $\frac{1}{2}$	
		nels in like	Red wood	1 $\frac{1}{2}$	
		proportion	Sandal wood	1 $\frac{1}{2}$	
Arms chests	12	12 musk-	Salt .....bags	25	
		ets each	Saltpetre	25	
Blackwood, candies	6	shipping	Shells .....No.	20	13 inch
—	7	landing	—	100	10 or 8
Copper sheet, chest	6	4	—	150	5 $\frac{1}{2}$ do.
— cases	4	3	—	300	4 $\frac{1}{2}$ do.
— slabs	100	80	Shot	150	24 pndrs.
Guns, iron or } No.	3	large	—	200	18 do.
brass ... }	2	3 pound'rs	—	300	12 do.
—	1	4 or 6 do.	—	400	9 do.
Japan chests	10	9 do.	—	500	6 do.
Metals all kinds, ton	1 $\frac{1}{2}$		Treasure ...boxes	6	4

MISCELLANEOUS ARTICLES.

Bullocks ... No.	2		Linseed oil ...jars	20	
Coals ton	2	1 $\frac{1}{2}$	Loose oakum		whatever
Cow and calf No.	1				quantity
Firewood { Ramiapatam .	500	large	Pecul weights of		can be
— Candarungum	1000	small	all kinds...peculs	30	25
— Checucottah	600		Pigs .....No.	15	
— Alumarary ...	2000		Ponies	2	stowed
— Kitnapatam ...	1000				conven-
— Alepanum ...	150		Poultry ...baskets		iently-
— Cuddalore ...	1500				any quan-
— Acheedandoa ...	2000		Sand, ballast ton	2	1 $\frac{1}{2}$
— Rangoon	2000		Seed, Cöcoanut No	200	
Ghee & oil dubbers	25		Sheep	30	
Horse No.	1		Tar .....barrels	8	6
			Tarpaulin ... No.	30	

The number of Passengers composing a Boat-Load.

European 12 persons. | Natives 15 persons.

N. B.—Two children are to be considered equal to one grown-up person.

666. MADRAS has no port or harbour, and lies close to an open roadstead, the shores of which are beaten almost constantly by a heavy surf. Ships lie off in seven to nine fathoms; their lading is carried to them across the surf in cargo boats called *Massula* boats made of very thin planks sewed together, with straw in the seams instead of caulking. The crews are seldom less than eight men, sometimes ten or twelve. Passengers using these boats go right on the beach and are carried through the thinnest of the surf, sometimes in chairs by the crew. Occasionally the surf is very heavy, even when there is no wind, and passengers are frequently wetted when landing. Ship's boats are rarely used except for going from one ship to another. Both at Madras and Pondicherry there are iron piers on screw piles, run out some distance from the beach, on which passengers can land from the ship's boats in fine weather or when the swell is not too heavy. Cargo is frequently damaged in passing through the surf. There is also much plunder by the boatmen, and consequently claims against the ship.

667. MAGNESIA is the oxide of the metal magnesium, used for producing the noted sun-light and occurs in nature under various forms of combination—as dolomite or magnesian limestone and nearly pure, in a hill in the peninsular of India, containing magnesia 46 parts, carbonic acid 51, insoluble matter and water 3 parts, in 100. Specific gravity 2.330. It is, however chiefly obtained by decomposing sulphate of magnesia (Epsom salts) with half its weight of carbonate of potash, each dissolved in water; when the solutions are mixed the carbonate of magnesia is precipitated, then washed and dried, cut up into cubic masses, and packed in chests of 1 cwt. each. It should be well preserved from sea-air and water, either of which may seriously deteriorate its value. There are other forms of magnesia in commerce, as the calcined, which requires to be carefully preserved in well corked and sealed bottles, and therefore, need no particular notice as to stowage different from cases of bottled drugs in general.

668. MAGNETISM OF CARGOES. Bar and railway iron, iron tanks, steam boilers, cylinders, machinery, guns, shot, iron ballast, iron ores, and other similar metallic substances will affect more or less, the condition of the ship's compasses, which therefore require special attention, or serious consequences may ensue. The course generally recommended is to take the exact magnetic position of the ship's head while lying alongside the wharf, before loading, and after these disturbing substances are in, to ascertain carefully the errors of the steering compass, in *its standard position*. Make a

table of these errors when the ship's head is on each separate point of *this compass*, without reference to any other compass in other parts of the ship, and act accordingly. The iron bands round trusses of pressed hay, stowed near the compasses, will cause a deviation.

669. Commander WALKER, R.N., who has made the subject his particular study, says, in his useful work on magnetism: "If a merchant vessel have a cargo of iron, or even iron tanks, steam boilers, or cylinders, so stowed in the hold as to be in *contact* with an iron knee or iron truss, bolted to the ship's side, and running upwards to the upper deck beams, such a piece of iron being in contact with large masses of metal in the hold, would *conduct* or *transfer* the magnetism from below, and certainly derange the magnetic needle, and cause the compass to indicate a wrong course.

670. "It is on this principle of magnetic conduction that separate pieces of iron, when brought into actual contact, act magnetically as a single mass. The water tanks in a ship of war, if stowed in actual *contact*, will act on the compass as if a single tank of the same size as the aggregate number of small tanks in the hold, occupied their places. But if kept separate by thin slices of board, then each tank, &c., will retain its natural quantity of inductive magnetism, and the place of its *poles* will change with the ship's motion, and produce a deviation.

671. "The amplitude azimuth observations made at sea give the difference between the astronomical bearing and the compass bearing of heavenly bodies, that is to say, a correction to be applied to the compass course the ship steers at the time of making the observation. The course correction therefore contains the variation and the ship's local attraction—either their sum or their difference; therefore the variation is everywhere known and recorded in tables or on charts, the mariner has only to make his amplitude or azimuth observations as frequently as possible, and in getting out his course correction he gets, at the same time, the deviation on his course steered, because the variation being given, his deviation is also given in his correction found for his course at the instant he took the altitude of the sun and its compass bearing." [See the Liverpool report on compasses, 14th May, 1862, in the article iron ships.]

672. **MAILS.** It has been estimated that taking the entire number of mail boxes sent in one year viâ Southampton and viâ Marseilles to the East Indies, &c., as 34,000, their actual weight would be 1,100 tons, and measurement for freight 2,300 tons, or rather under 10 cwt. to the ton of 40 cubic feet.

673. MALABAR. A master experienced in the East India trade says, 22nd November, 1867 "when 30s. per ton is the current rate of freight for cotton, &c., at Bombay, the rate on the Malabar coast, in the coffee season, is usually £2 15s. to £3 for ships between 400 and 500 tons. They will obtain dispatch there, and, being on the road home, will not extend their voyage. Cotton requires ballast, and then there is the additional expense of screwing and stowing. Coffee, ginger, coir, &c., can be taken in by the crew and are generally shipped at the rate of 40 tons per day. Provisions do not cost more, and the **port charges** on the coast are one half those at Bombay. The ports are perfectly safe nine months in the year." The same master says, "in March, 1861, my vessel was ordered by the agents to load cotton at Bombay for London at 27s. 6d. They said it was the wish of the owners, but my instructions were not to carry goods about the world unless a profit could be made. The vessel was chartered at £3 for a full and complete cargo of coffee in bags; 30 lay-days; demurrage £10 per day; to load at Mangalore and Tellicherry. At the first port 1,200 bags were obtained in three weeks, and at the second the lay-days expired when my lower hold only was full. The agent then said he would complete me with cases of coffee, but as the charter-party expressly stated bags, I refused to take cases otherwise than by a fresh charter. An endorsement on the first charter-party stated that they were unable to complete their agreement, and we mutually agreed to complete by a second charter-party at £5 10s. \textsterling ton for the remaining space adapted for cargo, which was to be coffee in cases and arrowroot in boxes. After paying me 800rs. they could not fill, and I received my sailing orders to proceed. Before leaving, I called survey on the space not filled and found it to measure 25 tons, and our draft of water would admit of 7 inches more by LLOYD's regulations. On my arrival in London, before breaking bulk, I served the charterer's agent with notice to survey, and then found the space to be 25½ tons, for which I obtained £5 10s. \textsterling ton as per second charter-party. My freight home that voyage was £2,700. Had I loaded at Bombay it would have been about £800, and the expense of the stowage.

674. MALT, unlike most other grain, requires to be kept perfectly free from air. For the Colonies, it is usually placed in an air-tight compartment or bin, the bulkheads being generally lined with tin or zinc: this is not always done, as four or five guineas \textsterling cent. are paid to cover risk of average, which would not be the case if so packed. By small coasting vessels it is frequently conveyed in bulk without dunnage or matting, in which case the ceiling requires to be well

cleansed and the bilge-water kept low, or it will be blown into and injure the cargo at sea. When cattle are conveyed in the main hold, and malt is stowed forward, dunnage is absolutely necessary to guard against the cattle drainage. The average weight of 100 quarters of pale malt 14 to 15 tons; of brown malt 11 tons; the weight varies according to the season and the quality of the barley. One week may be considered a reasonable time for discharging 722 quarters malt, when no time has been stated in the bills of lading. On the Crinan Canal 15 bushels go for a ton freight.

675. A **MANIFEST** contains the name or names of the places where the goods on board have been laden, and the place or places for which they are respectively destined; name and tonnage of the vessel, master, and place to which she belongs; a particular account and description of all the packages on board, with the marks and numbers thereon, the goods contained in such packages, goods stowed loose, names of the respective shippers and consignees, as far as such particulars are known to the master; it must be verified by his signature. It should be made out, dated, and signed at the place or places where the goods or any part of them are taken on board. There is a penalty for being unprovided. For convenience there should be two copies; one is required by the Customs' authorities on arrival. Ships from abroad are also required to add a list of stores. A separate manifest is necessary for tobacco.

676. The coast of **Norway** being extensive and irregular, and the population scanty, the regulations regarding manifests are of necessity stringent. In October, 1865, the Government passed a law imposing a penalty ranging from 22s. 3d. to £22 5s. A ship's manifest for Norway, may, however, be made out in any European language, and does not require a consular seal, so that a master can compile it himself at any leisure time during the voyage. In the **Grecian ports**, supplementary manifests may be delivered within three days; the manifests must include all the merchandise contained in the vessel, not excepting what the sailors or passengers have, on their own account. A separate manifest must contain the provisions and stores of the vessel. For the **United States** they should be on printed paper, three copies, ready when four leagues from the coast; penalty \$500.

677. **Mexico**. The following notification of the Mexican Government, was published in 1869:—Secretary of State for Finance. The attention of the Ministry has been directed to the little attention paid by captains of vessels who trade with the Republic of Mexico, as well as by the shippers of foreign merchandise abroad, relative to the

fulfilment of the legal necessities to be observed in drawing up the documents with which the goods should be accompanied. They imagine, no doubt, that the provision established by the circular of the 9th of August, 1867, declaring that the manifests and invoices of merchandise coming from Europe did not need to be viséd by consuls, extends to such a point that those documents may be dispensed with as unnecessary. Such a practice, besides being prejudicial to the Treasury, has the inconvenience of causing difficulties at the Customs, and of being onerous to trade, in event of an application of the law, in consequence of the irregular manner in which the shippers in Europe make out their bills of lading."

The President of the Republic consequently thinks right to remind all parties trading with Mexico of the obligation they are under of accomplishing strictly the different regulations, which must not be considered as abrogated by the above-mentioned circular, and principally for the cargoes which do not come direct from Europe, the only part where there are no consuls. With that object, merchants must observe the following stipulations :—

1. Every captain of a vessel coming direct from Europe with goods for the ports of the Republic is bound to establish his manifest, and the shippers to provide their bills of lading in conformity with the terms of Par II., Art. 21, of the Ordinance, with the sole difference that they are dispensed from the visa of the Mexican Consul, which before had to be presented at the Customs on the arrival of the vessel.

2. The manifests as well as the bill of lading will be considered by the Customs' authorities as sufficient, and will serve as a basis for the passing of the merchandise, as they must contain the conditions required by the dispositions in vigour.

3. Their absence or any omission, is liable to be punished by the penalties stated in Par. II, Art. 28, and others relating thereto.

4. The copies of manifests or bills of lading which were formerly delivered to the Mexican Consuls must now be forwarded by post, under cover, from the port of dispatch to the Minister of Mexico.

5. The above dispositions shall be put into execution six months from the date of the present circular.

6. The presentation of the Consular visa not being abrogated for vessels from the United States, and other ports where there are Consuls of the Republic, the penalties contained in the law will be applied in case the measures prescribed should be omitted. With that view the Government orders the consuls and vice-consuls to perform strictly the duties imposed on them by the Ordinance in vigour.

678. In the **Mexican ports** occupied by the Americans, if any article specified on the manifest be wanting, the vessel shall pay one dollar per ton penalty ; if any be found not in the manifest they shall be forfeited ; and if the value exceed one hundred dollars, the vessel

shall be seized and confiscated. At **Valparaiso** they must be accompanied with samples of all the cargo when of any value, and of the ship's provisions on board. In the island of **Puerto Rico**, the Spanish laws require a Consular certificate to be attached to all general manifests, and in default thereof a vessel is liable to a fine of £200. Masters bound there must be provided with said certificate, however distant the office of the consul may be from the port of loading. Ship and cargo from England, have, on arrival in a Spanish port, been seized and detained until her manifest has been sent out to her. In the **Brasil**s, ship's manifests are regulated as follows :—

Article 146. The master of any vessel sailing with a cargo for any of the Brazilian ports, ought to bring two copies, exactly alike, which must contain the name, description, and tonnage of the vessel ; the master's name, with the date at the end, and his signature ; the port where he took the cargo, stated in the manifest ; the port or ports said cargo is bound to ; the marks, countermarks, number of packages, and their descriptions, such as bales, boxes, chests, pipes, half-pipes, barrels, tierces, &c. ; a declaration of the quantity and quality of the merchandise in each packet, as near as possible, or of several homogeneous (similitude of kind) packages, with the same mark, and of the goods stowed loose ; the names of shippers and consignees or whether they are to order. Everything must be written in words at length, except the number of the packages, and on entire sheets of paper, not pierced to one another.

147. When a vessel has taken cargo at more than one port, she ought to bring a manifest from each port thereat she may have received shipment.

148. At the end of the manifests the master shall state the number of passengers, both cabin and steerage, and make all other declarations he may deem necessary.

679. **MANURES.** Although there is in commerce a great variety of artificial manures the may be divided into two classes, viz : those whose value is estimated principally by the proportion of their ammoniacal constituents, as—guano ; and the others whose value depends on the quantity of phosphoric acid contained in them as—superphosphate of lime. The former are sometimes neutral, and frequently of an alkaline character. The latter always have an acid reaction. Both containing soluble constituents, are capable of injuriously affecting goods placed in their neighbourhood, by moisture or water having access to them. As those which contain ammonia generally evolve pungent odours, they are capable of producing very detrimental effects, not only on animal and vegetable products, but also on iron and other metals ; and are very likely to injure fine chemicals if they come in contact. Some of these manures contain also large proportions of moisture, varying from ten to 30 and even 40 $\frac{1}{2}$ cent., and organic constituents being present with this water,

in a close hold, during moist warm weather, there is a liability at least to heating, and even in some cases to spontaneous combustion. As the presence of moisture or the access of moisture to manures, however dry they may have been when shipped, is likely in all cases to cause heating and the production of vapour, care should be taken, with general cargo, to avoid stowing in the vicinity of liquids, or of any moist goods liable to give off vapours. If stowed on the ceiling they will draw moisture from the bilge water to their own injury and to that of other goods in the same hold.

680. In coasting steamers, manures never go in the same hold with tea, which they have seriously damaged during a short passage only. In bags they should be all blocked together in as small a compass as possible ; not too near the ceiling. Whenever it is possible, manures should go by themselves. For voyages exceeding a week all artificial or chemical manures are recommended to be packed in casks, as the contents are then more closely pressed together than in bags, and moisture is consequently not generated so readily. Suitable dunnage should be used to prevent the approach of leakage, which will be readily absorbed by manures. In small quantities, water will seriously deteriorate their value ; a large quantity will destroy the value, and by the motion of the sea, the safety of the ship will be greatly endangered. Some instructions in the article guano will be equally applicable here ; see also bleaching powder, chloride of lime, vapour damage and ventilation. Oak tierces are preferred for distant inland transition.

681. With superphosphate of lime, *properly so called*, of which there is more manufactured than of any other artificial manure, no injury is likely to arise, except on the introduction of moisture, which it attracts in consequence of the chemical salts usually blended with the superphosphate. With moisture the vapour from superphosphate is very injurious to tea, coffee, spices, groceries, dried and fresh fruits, &c., and it will, like the vapour from guano, extract the colours from cotton prints, and by contact with hemp and similar goods, it may produce spontaneous combustion. Guano contains large quantities of organic matter, which, however, is not very injurious until moisture is introduced, or a damp climate is encountered ; the ammonia escaping from guano has been known to destroy, partially, the fine purple bloom so much valued on clover seed ; see the article guano.

682. **Glue Refuse**, in an unprepared state is used as a manure by agriculturists ; it consists of the remains of all the pieces of hides and skins, from which all the gelatine has been extracted in the

tanyard. It is in a moist state like clay, and is frequently packed in soda casks; the odour is most offensive.

683. In March, 1858, 20 tons patent wool manure in 181 bags, were placed on the ceiling of the fore hold of a schooner from London to a channel port; 10 tons of hemp, in bales and in bulk, were stowed on it. The crew complained of the disagreeable vapour which arose in the fore-castle during the short passage, and on opening the hatch-way at the port of discharge, six days after, this vapour, which had become extremely dense, prevented for some time any access to the hold. A dampness pervaded all the bags of manure, which partially escaped on exposure to air. The consignee averred that the manure was dry when sent to the wharf, where it lay some time; the wharf-finger states that "the manure was, no doubt, wet when sent to the wharf." The hemp was all more or less damp, and the affected part had become so rotten, that the owner had to pay the consignee a considerable sum for damages. Masters will observe the necessity there is for *greater* caution when conveying manures similar to the one first described. The analysis of the wool manure in question was as follows:—

(A) WOOL MANURE.

Moisture	16'40
Organic Matter and Salts of Ammonia	27'74
(Ammonia 6'23)	
Sand	9'13
Biphosphate of Lime	7'46
(Equal to Neutral Soluble Phosphate 11'01)	
Neutral Insoluble Phosphate ..	7'05
Hydrated Sulphate of Lime	31'83
Sulphate of Magnesia	'39
<hr/>	
100'—	

684. In contradistinction to the above, there are manures not exposed to this liability, through the absence of putrifying or decomposing matter. Manure manufactured as below is stated to be free from such matter.

(B) SUPERPHOSPHATE OF LIME.

Moisture	8'91
Soluble Phosphate of Lime	25'70
(Equal to Bone Earth 40'11)	
Insoluble Phosphate of Lime—(Bone Earth).....	6'68
Anhydrous Sulphate of Lime	12'38
Gypsum	43'05
Alkaline Salts	'96
Insoluble Siliceous Matter.. ..	2'32
<hr/>	
100'—	

685. Generally speaking, manufacturers will readily deliver copies of the analysis of manures ; indeed under section 329 Merchant Shipping Act, 7 & 18 Vict., c. 104, shippers are bound to give, on demand, a correct account of the contents which they proposed to have conveyed. When a master is in doubt as to the nature of the contents of any manure offered for freight, he should consult some competent authority, rather than incur the risk of danger to his ship, or to other goods in a general cargo. Artificial manures are usually packed in bags $1\frac{1}{2}$ and 2 cwt. each.

Tonnage. No specific rule can be laid down regarding the proportionate stowage of manufactured manures. For the West Indies one ton wool manure (A) is packed in a hogshead, or very nearly so ; if 40 tons are ordered, 41 hhds. are sent ; the contents would then be within five cwt. either way. A ton by analysis (B) will occupy 38 cubic feet. A vessel of 60 tons register will stow 85 to 90 tons of the LONDON MANURE Co.'s superphosphate of lime. Ordinarily 20 cwt. superphosphate, packed in bags of $1\frac{1}{2}$ cwt. each, will occupy 38 cubic feet ; but the article varies, as some sorts contain 10, others 21 $\frac{1}{2}$ cent. of moisture. LAW's patent superphosphate of lime weighs 81 lbs., RAMSAY's 81 lbs., NORRINGTON's 75 lbs., best PERUVIAN guano 69 lbs. per bushel.

Bone Manure. In the London table of goods proportioned in stowage at the commencement of this work, 12 tons bone manure in bulk are stated to occupy the same space as 20 tons of coal, *i.e.* 1 keel or 850 cubic feet. This calculation is at the rate of 40 feet for a ton of coal, and 70 feet for a ton of bone manure.

686. MARBLE ; see stone.

687. MASTER. Although the duty and the interest of the master is involved in all the subjects referred to in this work, yet there are some points which come more especially under his supervision, and for the execution of which he alone is responsible. Appended hereto, page 401, are the instructions for stowage by LLOYD's, the instructions from a London firm of experienced shipowners, the letter of advice given to masters by a Liverpool house, and the recommendations of the Sunderland Freight Association. Some of these instructions are similar in each code.

688. On receiving cargo it is absolutely necessary that masters should ascertain that the full quantities specified in the bill of lading, are sent on board, and that the cases, casks, bales, &c., are of the dimensions specified. When loading, with heavy cargoes especially, it is desirable to fill the middle of the ship first, and in discharging to begin at the two ends, to prevent hogging. Before leaving port a master should ascertain that he has all the ship's papers ; instances have occurred where the Officers of Customs have delivered the wrong register, and the error has not been discovered until the conclusion of the voyage. Before the outward cargo is *fully* dis-

charged, especially if by terms of charter-party or otherwise, iron or other weight can be retained as stiffening, give notice in writing to the proper authorities, in order that a sufficient quantity of this stiffening may be retained until the receipt of an adequate amount of homeward cargo, to allow of the safe discharge of the remainder of the outward cargo. It might occur that although notice is given, no homeward cargo may be ready for some time, and it would be better to convert the ship into a warehouse than to have to purchase an expensive quantity of ballast, which it might be necessary to discharge again as prospects improved and cargo began to offer. It often happens that the railway companies in India would rather that their rails, chairs, and sleepers, should lay under cover in the hold of a ship than ashore on the bunders or wharves.

689. In order to settle the measurement for freight of cotton at Bombay, it is the practice out of say every hundred bales placed on the wharf, for the master to select five and the shipper five; the selection is a most important duty. The natives are said to be very ingenious in giving comparatively small bales an appearance of magnitude by landing them on stones and inequalities which are concealed by the bales themselves. On the other hand their penetration in readily picking out diminutive bales, appears to a European to be almost marvellous.

690. When chartering *coal* for Dieppe, Mr. RHODES, Vice Consul there, recommends, 13th March, 1868, this clause: "Cargo to be weighed by the sworn meter (*peseur juré*) whether in railway wagons or in carts." The **charges** for weighing are £ 100 tons in railway wagons 3 francs, in carts 5 francs. In Belgium, the proportion officially recognised for *grain* is 29 hectolitres to 10 quarters; this is much against the ship; the remedy is to fix the French measures when chartering. If a copy of a *charter-party* is signed, it must be stamped; if copied in full it need not be stamped. The original charter-party whether single, duplicate, triplicate, &c., must be stamped. The duty is 6*d.*; within seven days 4*s.* 6*d.*; 28 days £10.

691. When loading some descriptions of goods in hot climates, especially sugars in bags, they are often injured by contact with the melted pitch of the deck seams; planks or mats should be used in such cases. Every part of the ship should be carefully covered with awnings or a matted framework of bamboo; and the decks wetted down morning and evening. The same course applies to the boats whether afloat or hanging on the davits. This should never be disregarded in the Indian ports, even if it partially affected the pushing on of the discharge or lading of the ship.

692. After lying some time in a tropical port the topsides should be caulked ; and they should also be wetted by skidding or other means ; see grain. These precautions are especially necessary on the Gold Coast, during the prevalence of what is there termed the "Harmattan," a dry wind with no dew, which opens the seams in the sides and decks, although the planks are two or three inches thick. The effects of the harmattan on evaporation are very great ; at Liverpool the annual evaporation is about 36 inches, at Whydah 64, but under the influence of the harmattan, 133 inches. Heat sent into a cargo through the decks and topsides is sometimes attributed to have commenced among the goods themselves.

693. Previous to every voyage, the topsides of a vessel and the wales should be tried, and the deck ; especially the stanchions and waterways, the butts of the deck, and round all the bitts and combings of hatchways, cants round deck houses, and the fronts of poops. It is said that in the break of the poop (front of the poop) the water frequently finds its way down to the cargo ; because, underneath the cant, the caulking of the seams running under the cant, cannot be tried. Frequently in high-class ships, all the precautions that can be taken, are taken, to make the cant secure. Lead is laid on felt, all the way under the cant. But that is not a perfect cure, because the water will find its way under the lead, and the felt rots.

694. When the decks are caulked, the cook's galley, if moveable should be removed entirely, and that part beneath should receive its full share of attention. It sometimes happens that rubbish is allowed to accumulate here until it is sufficiently solid to prevent leakage ; and perhaps just before going to sea, a pump-hook or iron rod is thrust in to clear it away, and if the end does not create a leak, the removal of the rubbish will probably do so, especially if hot cinders have melted the pitch between the seams. After heavy weather the bolts which fasten the galley, &c., to the deck, should be carefully inspected, for if loosened or drawn, water will get into the hold and damage cargo to a serious extent. The old wet oakum should be picked out clean from the waterways when they are leaky, and fresh put in over a thread of spunyarn. If the wet oakum is left in it soon wets the new oakum, and then the beam ends and knees below are destroyed. After lying a long time on one tack at sea, a vessel should bear up, sound the pumps, and, if necessary, clear the hold.

695. A barrel of coal tar, for the free use of the crew, is occasionally placed either in or under the forecastle in small vessels, and the waste has been known to damage the cargo seriously ; see tar. Sometimes, in small ships, the crew in the forecastle, instead of

throwing waste water overboard, let it fall into the coal bunks or the hold ; these drainings frequently rot the timbers forward, especially where the part is bulked in from the air. All the planking and timbers of steam-ships, which come in contact with steam, are liable to injury from it.

696. An experienced master recommends that on nearing the channel after a voyage, tallies ready to put upon all the "jags" of running gear, which, when it is unrove, should be carefully jagged up ; each jag should be five fathoms long ; good stops on the bights, and a stop on every two feet ; when made up thus it is easily handled and passed about. As soon as you have cleared the 'tween decks, the running gear and spare rope should be placed where it will not require moving again until the ship is fitting out. As soon as the hold is sufficiently clear, two good barricades should be built up—one in the fore hold and another in the after hold—for stacking all the dunnage wood upon them. Have all the quoins picked up and put in bags or laid in one place 'tween decks ; but they are much better in bags locked in a spare lower-deck cabin ; the cook cannot burn them nor labourers carry them away. By stacking the dunnage on barricades you do not have to move it, and the ends of the ship and keelson are clear either for taking off the limber boards, or for cleaning and scraping. Whatever may be taken in to stiffen the ship should be placed so that the surveyors can see any part of the keelson and the limber boards ; also in such a position as not to prevent the reception of outward cargo. When ships discharge in the London Docks, the cost of abstracts of cargoes supplied at the dock-house, Billiter-square, is for each abstract containing the weights, measurements or quantities of 10 marks or parcels or under, 2s. ; 11 to 20, 3s. 6d. ; upwards of 20, each mark or parcel 2d. ; but not to exceed 10s. 6d., including an abstract of the certificates of damage.

INSTRUCTIONS TO COMMANDERS AND MATES FOR THE STOWAGE OF MIXED CARGOES,

Prepared by HENRY C. CHAPMAN & Co., Agents for LLOYD'S, Liverpool ; and approved and recommended by the Committee for managing the affairs at LLOYD'S.

1. Owners, commanders, and mates of ships are considered in law in the same situation as common carriers, it is therefore necessary that all due precautions be taken to receive and stow cargoes in good order, and deliver the same in like good order. The law holds the shipowner liable for the safe custody of the goods when properly and legally received on board in good order, and for the "delivery" to parties producing the bill of lading. The captain's blank bill of lading should be receipted by the warehouse-keeper or person authorised to receive the contents.

§ B

Goods are not unfrequently sent alongside in a damaged state, and letters of indemnity given to the captain by the shippers for signing in good order and condition ; this is nothing more or less than conniving at fraud ; fine goods are also often damaged in the ship's hold by lumpers, if permitted to use cotton hooks in handling bales. All goods must be received on board according to the custom of the port where the cargo is to be taken in, and the same custom will regulate the commencement of the responsibility of the master and owner.

2. Hemp, flax, wool, and cotton, should be dunnaged 9 inches on the floors, and to the *upper part of the bilge*, the wing bales of the second tier kept 6 inches off the sides at the lower corner, and $2\frac{1}{2}$ inches at the sides. Sand or damp gravel ballast to be covered with boards. Pumps to be frequently sounded and attended to. *Sharp-bottomed ships one-third less dunnage in floor and bilges.* Avoid horn shavings as dunnage from Calcutta.

3. All corn, wheat, rice, peas, beans, &c., when in bulk, to be stowed on a good platform, or dunnage wood, of not less than 10 inches, and in the bilges 14 inches dunnage ; the pumps and masts cased, to have strong bulkheads, good shifting boards, with feeders and ventilators, and to have no admixture of other goods. Flat-floored wall sided ships should be fitted with bilge pumps. On no consideration must the stanchions under the beams be removed.

4. Oil, wine, spirits, beer, molasses, tar, &c., to be stowed bung up ; to have good *cross beds* at the quarters (*and not to trust to hanging beds*), to be well chocked with wood, and allowed to stow three heights of pipes or butts, four heights of puncheons, and six heights of hogsheads or half-puncheons. All moist goods and liquids, such as salted hides, bales of bacon, butter, lard, grease, castor oil, &c., should not be stowed too near "dry goods," whose nature is to absorb moisture. Shipowners have often to pay heavy damages for leakage in casks of molasses, arising from stowing too many heights without an intervening platform or 'twixt decks. From Bengal, goods are frequently damaged by castor oil.

63 Gallons make	.....	1 Hoghead.
84 -	.....	1 Puncheon.
126 - or 2 hhd.	.....	1 Pipe or butt.
252 - or 2 pipes	.....	1 tun.

5. Tea and flour in barrels ; flax, clover, and linseed, or rice in tierces ; coffee and cocoa, in bags ; should always have 9 inches, at least, good dunnage in the bottom, and 14 to the upper part of the bilges, with $2\frac{1}{2}$ inches at the sides : allowed to stow six heights of tierces, and eight heights of barrels. All ships above 600 tons should have 'twixt decks or platforms laid for these cargoes to ease the pressure—caulked 'twixt decks should have scuppers in the sides, and $2\frac{1}{2}$ inches of dunnage laid athwartship, and not fore and aft ways, when in bags or sacks : and when in boxes or casks not less than one inch. Rice from Calcutta is not unfrequently damaged by indigo, for want of care in stowing.

6. Entire cargoes of sugar, saltpetre, and guano, in bags, must have the dunnage carefully attended to, as laid down for other goods. Timber ships are better without 'twixt decks, if loading all timber or deals. Brown sugar to be kept separate from white sugar, and both kept from direct contact with saltpetre.

7. Pot and pearl ashes, tobacco, bark, indigo, madders, gum, &c., whether in casks, cases, or bales, to be dunnaged in the bottom, and to the upper part of the bilges, at *least* 9 inches, and $2\frac{1}{2}$ inches at the sides.

8. Miscellaneous goods, such as boxes of cheese, kegs and tubs of lard or

other small or slightly-made packages, not intended for broken stowage, should be stowed by themselves, and dunnaged as other goods.

9. Barrels of provisions and casks of tallow allowed to stow six heights. All metals should be stowed under, and separated from, goods liable to be damaged by contact.

10. All manufactured goods, also dry hides, bales of silk, or other valuable articles, should have $2\frac{1}{2}$ inches of dunnage against the sides, to preserve a water-course. Bundles of sheet iron, rods, pigs of copper or iron, or any rough hard substance should not be allowed to come in contact with bales or bags, or any soft packages liable to be chafed. When mats can be procured they should be used at the side for silk, tea, &c.

11. Tar, turpentine, resin, &c., to have flat beds of wood under the quarters, of an inch thick, and allowed to stow six heights.

12. Very frequent and serious loss falls on merchants on the upper part of cargoes, particularly in vessels that bring wheat, corn, tobacco, oil-cake, &c., arising from upper vapour damage imbibed by wheat, flour and other goods, stowed in the same vessel with turpentine, or other strong scented articles: the shippers are to blame for such negligence, for not making due enquiry before shipping.

13. Ships laden with full cargoes of coal, bound round Cape Horn or Cape of Good Hope, to be provided with approved ventilators as a preventive against ignition.

14. No vessel bound on any over-sea voyage, should, on any account, be loaded beyond that point of immersion which will present a clear side out of water, when upright, of three inches to every foot depth of hold, measured amidships, from the height of the deck at the side, to the water.

NOTE.—Shippers abroad, when they know that cargoes will be stowed properly, give a preference, and at higher rates, to such commanders of ships as will undertake to guarantee the dunnage. The American ship-owners, in the stowage of mixed cargoes in large ships, have, from experience, discovered what "pressure" barrels of flour, casks of provisions, &c., will bear, and so avoid reclamations for damage, if otherwise properly stowed: hence, in large ships above 600 tons, with dimensions exceeding in length $4\frac{1}{2}$ times the beam, and 21 feet depth of hold, orlop decks will come into general use, so as to relieve the pressure by dividing the ship's hold, like a warehouse, into stories. A large ship, called the *Liverpool* which left New York in December, 1854, with an entire cargo of flour, has never since been heard of; it is supposed the lower tiers of barrels gave way under the pressure, and the cargo having got loose, shifted in a gale of wind and capsized the vessel. Ship's cargoes, for insurance, will also become a matter of special agreement between merchant and shipowner, and merchant and underwriters, and the premiums vary according to the dunnage agreement. The stowage and dunnage must stand A1., and is often of more importance than the class of the vessel, has experience has proved. When ships are chartered for a lump sum, the draught of water should be limited, as it not unfrequently happens that brokers insert a clause that coals are not to be considered as dead-weight, in order to fill the ship up in case of goods falling short to make up the chartered freight. All packages, bales, and cases not weighing more than 15 cwt. to the cubic ton measurement, are designated as light freight. [Published under the direction of LLOYD'S Committee.] *All these instructions are embodied in this work, but are inserted here, in their original form, for reference in case of necessity.*

GENERAL INSTRUCTIONS TO MASTERS (LONDON).

OFFICIAL log to be kept by the captain and every occurrence of moment to be inserted, duly attested by the signatures of the chief and second officers. Important entries to be further certified by the signature of carpenter and one of the crew, if necessary.

You must on no account omit to *keep your lead going* whenever near the land—nor forget to keep a *good look-out*. We believe one half the casualties at sea arise from neglect of these two most important matters. The relieving officer of the night watches should muster his own watch and station his lookouts fifteen minutes after the watch is called. The name of the look-outs should be stated in the ship's log.

We beg your closest attention to the stowage and dunnage of the cargoes—both at home and abroad, as in case of improper stowage or deficient dunnage, your own wages, and your mate's, will be liable for the loss in consequence; and we wish to observe that no advantage of freight or stowage can compensate for the evil of leaving out any of the 'twixt deck stanchions during the voyage. We can never admit it as an excuse that you trusted these things to your officers, they are of sufficient importance to merit your own personal superintendence.

You must never make any change whatever in the paint, spars, rigging, scuttles, or arrangement of the cabins of the vessel, unless the extra freight obtained will fully compensate.

It is desirable that you should retain your officers and carpenter until your return home.

You must avoid the infliction by yourself or officers of corporeal punishment on your crew, particularly on your apprentices, whom you will always mess apart from the rest of the crew, and instruct as much as you can in your profession.

You will take care your carpenter keeps all the upper works of your ship free from chafe or appearance of injury, making him pay particular attention to the caulking of the topsides, gunwales, waterways, stanchions, bitts, knightheads, &c., as these places are most liable to leaks, and vessels require particular care in dunnaging in this vicinity.

In the event of your loading a cargo liable to steam or "sweat," you must take care your ventilators FORE AND AFT are kept open, by every opportunity and means in your power, to allow a draught through the ship.

You must keep a ship's disbursement book, and post it daily, and whenever you leave any port abroad, where you have spent any money on account of the ship, you must leave a copy of your disbursements behind you to come by the next conveyance, so that should anything happen to you or the vessel, her accounts can be made up.

On arriving at any port abroad, your first letter should contain a sketch of your passage, with any particulars you think may be of interest to us.

When you are in any place east of the Cape of Good Hope, you should write by every opportunity for the overland mail, and your letters should always be addressed "viâ Marseilles," unless merely duplicates, or containing heavy papers, such as protests, vouchers, &c.,—in which case "viâ Marseilles, must be omitted, as they will come by Southampton at a lower rate of postage.

We trust you will always keep up a proper state of discipline amongst your crew, which is not only conducive to the interests of the vessel, but to the comfort of all on board.

You will carefully superintend the keeping of the vessel's log-book, into which the whole of the day's work must be entered, including the dead reckoning, latitude by observation, longitude by chronometer and lunar observations, whenever taken ; you will also take care that all casualties are carefully noted.

Sails, at all times, to be kept well-aired, and repaired when necessary.

Never leave any port without being properly virtualled and equipped for your intended voyage, in order that you may not have occasion to put back or touch at any intermediate port, which can only be justified by circumstances of extreme necessity.

When discharging cargo, never allow anything to go from the ship without consignees' or captain's order to first officer.

Forecastle to be kept clean and well ventilated. We suggest that the crew may be allowed one afternoon per week for scrubbing their clothes. [An experienced master suggests that the bedding of the crew should, in fine weather, be taken out and aired frequently, and that in the event of the serious illness of any member of the crew at sea, accommodation should be provided aft in a cabin if possible, so as to ensure careful attention, and to avoid the discouraging influence on the other seamen. That divine service be performed at least once on the Sabbath at sea. In harbour in foreign ports, he deprecates the system of ship to ship visiting on the Sabbath, and prefers that the ship's boats be used only for the purpose of taking the men to and from the Bethel ship, or any church on shore. The apprentices or other lads to be encouraged in their religious duties, and all unnecessary Sunday labour to be avoided.

Listings to be removed, and coal-hole, fore and after peaks, and limbers to be well cleaned out, at every opportunity. We attach the utmost importance to this duty.

Protests and surveys to be all in order, in event of damage to ship or cargo. The latter to be surveyed before leaving the vessel, claims being often made upon the ship even weeks after the cargo is in the warehouse.

Bills of lading never to be signed for weight or contents unless you have personal knowledge of same being correct.

Your blank bills of lading should be receipted by the warehouse-keeper or the person authorised to receive the contents.

Immediately on your return, we require to be furnished with vouchers and accounts for the voyage, to be kept in consignees' accounts current, portage bill, log, and expenditure books, statement of condition of hull, sails, rigging, and spars, *with a list of all stores remaining on board.*

If ever you should unfortunately be in any difficulty with your ship, that it became necessary to procure or take assistance either by steam or manual service, be cool and collected, act with firmness and make every endeavour to arrange the terms (either in writing or in presence of third parties) upon which your engagements are made. Claims for salvage often arise when by a little foresight and presence of mind, an agreement might be entered into which would prevent any dispute.

In the event of your not loading for this country or in case of any accident happening on your voyage compelling you to put into port, we give you at foot names of our various correspondents abroad, to whom consign your ship, or apply for advice and funds, should you be compelled to put into any of the places named : and that you may be posted up in cases of difficulty, we wish you to take with you "LEES' Laws of shipping," "STEVENS on Stowage," and latest edition of "Mer-

cantile Marine Act." Bottomry bonds must be avoided, and with the frequency of steam communication to all ports, and the complete arrangements made, it is generally better to communicate with home first rather than give them.

You will distinctly understand that you are not allowed to do any business, or trade, or barter on your own account.

If possible, never give away the consignment of your ship, but reserve it, and address yourself to our friends named below, unless otherwise instructed by us.

[Here follows a list of names.]

GENERAL INSTRUCTIONS TO MASTERS (LIVERPOOL).

DEAR SIR,—Having appointed you to the command of the.....we would call your attention to the following and annexed suggestions, with a view to your maintaining good discipline on board, and pursuing the business of your vessel with energy, and exercising careful economy in regard to her disbursements:—

Keep your ship clean and in good order.—When you see a proper opportunity ask to be reported, as you have MARRYAT'S signals on board.

In running down the trades, you will as usual shift your sails, repairing such as require it; the same may apply to your homeward passage, as all sails have to be repaired on board. *On arrival at your port of discharge, never neglect to note your protest immediately.* Then make arrangements for discharging your cargo, and give notice when ready to do so.

Hold a survey on your hatches before opening them, and at the same time get a certificate of survey from the surveyor; for should it so happen that any cargo turns out damaged, and you have not obtained such certificate, it may cost considerably more, and occasion far more difficulty to get than it would otherwise.

Should any cargo be damaged get a certificate to that effect as above.

Get receipts for all your cargo at time of delivery.

Having discharged outward cargo, give notice, in writing, of being ready to load homeward cargo. On the expiration of your lay-days, give notice in writing of same (inserting a copy thereof in ship's log-book), and then claim demurrage.

Should your claim for demurrage not be paid before sailing, get your charter-party endorsed as to the number of days occupied in loading, and if the consignee refuses to do so, go to the British consul, or a notary, and note a protest of his refusal.

Always get copies of your protests and surveys.

Should you engage cargo at one port and have to fill up at others, you must, before signing bills of lading at first port, insert the clause of "*vid such and such port or ports.*" neglect of this will make the ship liable for all losses consequent on a deviation from the direct voyage from port of loading to port of discharge.

Never go out of a ship's direct course to gratify any curiosity to have a look at a place in passing.

In case of ship being open for charter, and you should not, on your arrival, find letters enclosing homeward charter, do not appear to be over anxious about a freight, but state that you expect instructions from your owners by next mail, and in the mean time make yourself thoroughly acquainted with every thing offering in the freight market. However much you may desire to return to one port in preference to another, conceal your wishes on this point, as otherwise by your openly stating a particular wish to your consignee to return to London or Liverpool rather than any other port, may and very frequently does, occasion a

considerable loss to the ship. Always endeavour to keep consignment of vessel open in this country.

Write fully by every available opportunity, and never omit to send copies of disbursements, accounts, protests, surveys, charter-parties, &c., &c. Name the date of ship's arrival and departure from each place. When in the United Kingdom write every second day.

IN FIXING SHIP. 1st. Take care to have stamped charters and bills of lading. They can be got stamped within 14 days after date, without payment of any penalty, and at the head office in London, within one month after date on payment of £10 penalty. After a month they cannot be got stamped at all.

2nd. Let no charterer sign as agent unless he states for whom he is agent. A man of straw, or a foreigner, may be the principal.

3rd. When a foreigner is the principal, try to get the agent in England, who effects the charter, to make himself liable as principal, and to sign the charter without adding the word agent.

4th. If freight is not payable in cash on delivery, take care that the bills are to be "*approved bills*," and not charterer's bills, as in the latter case, the shipowner cannot hold the cargo for his freight, even though the charterer was notoriously insolvent. If a charterer objects to the stipulation for "*approved bills*," he is generally not safe and his charter should not be taken.

5th. In stating days allowed the merchant, it is proper to say "*running days*," or "*working days*," according to the intention. In London "*days*" mean "*working days*," and Sundays and holidays do not count until the ship is on demurrage. After that time all days count.

6th. In bills of lading of a ship to consignees in England from consignors abroad, have a clause inserted—"consignees paying freight and *demurrage*," if you wish to have a remedy for your demurrage.

IN LOADING. 1st. Enter the ship at the custom-house. The days count from entry at the custom-house and being ready to load.

2nd. It is however proper to give notice to the merchant, of arrival and being ready to load; and it is generally better to do this in writing, as it is more easily proved in case of need.

3rd. Enter in the log-book the day of arrival at the port of loading and entering at the custom-house. Also enter a copy of the notice given to the merchant. Also enter in the log-book the day loading is completed.

N.B. The signature of the master to the entries in the log, as well as that of the mate is very useful in case of dispute. If the master be owner or part owner, the entries should be signed by the mate, and the second mate, carpenter, or eldest apprentice.

4th. If the merchant's correspondent abroad is willing to give a certificate on the back of the charter or bill of lading, of the correct number of days expended in loading, get him to do so, but do not on any account allow him to certify a smaller number of days than were really spent. Rather do without his certificate as it is not at all necessary to have it.

5th. In case the merchant's correspondent at port of loading should refuse to furnish a cargo, the master should, on the expiration of the lay days allowed by charter, protest against the merchant, and he is then at liberty to return in ballast to his chartered port of discharge, and has a right to his full freight. The better plan, however, is to take the best freight he can get for his chartered

port of discharge, and claim the deficiency of the freight from the merchant. It is improper to wait the demurrage days, unless required so to do by the merchant.

IN DISCHARGING. 1st. Enter ship at custom-house.

2nd. Give notice to merchant of being ready to unload.

3rd. Make similar entries in the log-book of entering ship at custom-house, of notice given to the merchant, and of the day the discharging is completed, and let them be signed as before directed in the case of loading, by the master and mate, or if the master be an owner, then by the mate, and the second mate, carpenter, or eldest apprentice.

4th. If you are chartered, but have signed bills of lading, to a consignee, before you part with the cargo, the consignee should produce the endorsed bill of lading. He should also undertake for payment of freight according to bills of lading, particularly if you have any doubt of your charterer's solvency.

It is doubted whether the owner of a *Chartered* ship can recover his freight from a consignee who has once got hold of the cargo, without giving any express undertaking to pay; and it is said the only remedy is against the *charterer*.

N.B. You cannot hold the cargo for demurrage, and only for freight in terms of charter-party or bill of lading.

RECOMMENDATIONS TO MASTERS OF VESSELS (Sunderland).

In chartering do not allow the charterer to sign as agent unless you approve of his principal, nor agree that he shall not be liable for any delay in loading, nor that his responsibility shall cease when the cargo is on board, nor that the ship shall discharge in turn, nor that the master shall sign bills of lading at an rate of freight presented, and without qualification.

In stating days allowed the merchant, it is proper to say "running days," or "working days," according to intention. In London, "days," mean "working days," and Sundays and holidays do not count until the ship is on demurrage; after that time all days count.

PAYMENT OF FREIGHT. When an advance of freight is to be paid, make it payable on signing bills of lading, and not on the sailing of the ship. When foreign money is to be paid, make it at the current rate of exchange. When hills have to be given, have them good and approved bills, and not charterer's acceptance. Do not make the freight payable two months, or any time after the delivery of the cargo, but either "during delivery," or "on delivery."

The following mode of payment of freight is objectionable. "The freight is to be paid on the quantity delivered, by an approved bill on London at three month's date from the delivery to the charterers of a certificate, signed by the consignees, of the right and true delivery of the whole cargo, agreeable to bills of lading; or in cash, under discount, at charterer's option."

INSTRUCTIONS TO MASTERS. It cannot be too clearly understood that the payment of freight depends very much on the care that the master bestows on the cargo, and that he is bound to deliver it in the same good order and condition in which it was received, (the act of GOD, dangers of the seas, &c., &c., excepted). Owners have often had large sums to pay for damage to cargo, arising from the following causes, which with ordinary care might have been prevented.—

Runs not being clear.—Dunnage not being good and sufficient.—Ship not being properly matted out.—Pump-well, mast cases, bulkheads, shifting boards, and chain

locker not being substantial and secure.—Neglected air ports, by which cargo reaches the pumps and chokes them.—Leaky ports.—Coverings of hatchways and coatings of masts being insufficient or imperfect.—Inattention to the pumps. Attend the pumps carefully, and enter in each day's log, "pumps carefully attended."—Improper stowage, a point to which too much attention cannot be given.—Cutting timber or deals, and breaking open packages for stowage beyond what is provided for by the charter, the usages of the trade, or without the written consent of the charterer or shipper, and deck load being carried over a perishable cargo.—Rats, mice or other vermin.

It is recommended for all captains to examine the mast-cases, pump-well, and chain trunks, and to have the dunnage laid under their own inspection, before taking in cargo.

Notice in writing to be given to the charterers, consignees, or agents, when the ship is ready to load or discharge, and a copy to be entered in the log-book, signed by the person who delivered the notice.

The signatures of the master and mate will be very useful in case of dispute. If the master be owner, or part owner, the entries should be signed by the mate and second mate, or other intelligent member of the crew.

No master should consent to vary the terms of his charter, or alter his voyage without the greatest caution, and then only with the charterer himself, or his agent, having his written consent, which written consent ought to be given up to the master before making the alteration, otherwise the charterer will be discharged from the contract, and the owner liable to an action for a breach of contract. If there be a telegraph, it would be better for the master to refer to his owner for instructions.

In case the merchant's correspondent at port of loading should refuse to furnish a cargo, the master should, on the expiration of the lay-days allowed by charter, protest against the merchant, and he is then at liberty to return in ballast to his chartered port of discharge, and has a right to his full freight. *The better plan*, however, is to take the best homeward freight he can get, and claim the deficiency of freight from the merchant. It is unnecessary to wait the demurrage days, unless required to do so by the merchant.

SURVEYS. A ship having received damage, or touched the ground before arriving at her port of loading, ought to be surveyed and a certificate of her seaworthiness, in duplicate, obtained before taking on board cargo; the master to send one by post to his owner, and retain the other on board for his own use.

A ship putting into an intermediate port for repairs, the master must have a certificate of survey on the damage received and the ship's seaworthiness before leaving. If the cargo be a perishable one, and there is reason to think it is damaged, it will be necessary to have a survey on it, and obtain a certificate that it is or has been put into proper condition for its passage to the port of destination.

Freight cannot be claimed on damaged cargo sold at an intermediate port, hence it is always better to put it into the best condition possible, and bring it on. In most cases of survey abroad, it will be proper to have the certificate in duplicate, attested by the consul or other public functionary; one to be sent to the owner by post, the other retained on board for the master's use.

It will be proper to have a survey of the hatches and dunnage at the port of discharge; and when the hatches are opened to take samples; at a port of call, get a certificate from the merchant's agent that they were in order when opened.

When you call at one port for orders to discharge or load at another, ask for your orders in writing, and take care of them, they will be useful in case of dispute.

BILL OF LADING. Never be induced to sign bills of lading before the goods are on board, or without the mate's receipt being given up or cancelled, or without first carefully reading them over, and comparing one with the other, not only to see that they are alike, and that the quantity of goods and rate of freight are correct, but that nothing is inserted contrary to the fact on the charter-party, if there be one.

Do not sign bills of lading for a less freight than what is in the charter-party, but say—freight, demurrage, and all other conditions, as per charter.

Insert the correct number of days consumed in loading, on the margin of the bill of lading, but do not have a smaller number certified than were really spent ; rather do without it.

Interest and insurance on money advanced, and address commission paid at port of loading, ought to be endorsed on the bills of lading. This is a receipt which the receivers of the cargo cannot dispute.

Qualify your risk by adding "quantity and quality unknown, not accountable for leakage, breakage, rust or injury by vermin," or whatever else you think will suit the goods you have on board.

If it be attempted to ship goods in a damaged or improper condition, give the shipper notice in writing, and if he fail to replace them with sound, say,—“shipped in a damaged condition,” or “shipped in improper condition.”

If the shipper refuse to allow the above qualification, and you find it necessary to protest on this or on any other account connected with the bill of lading, say,—“signed under protest.”

Before signing bills of lading enter deck load at shipper's or charterer's risk, even if provided for in charter or otherwise.

Deliver your cargo to no one unless he produce one of the bills of lading which you have previously signed, properly endorsed.

Before signing bills of lading in a foreign language, they ought to be translated. Many of them omit the usual exceptions, “the Act of GOD, the Queen's Enemies,” &c., and have objectionable clauses in them. Where they cannot be translated, it will be proper to add, “freight and all other conditions, as per charter-party, and anything contrary thereto to be void.

Bill of lading, when there is no charter-party, should say “consignee paying freight, demurrage, and all other charges ;” also, “goods to be taken from alongside at consignee's expense and risk.”

In England, it is customary in the case of ships loading general cargoes for abroad, to sign bills of lading for freight paid in advance, but not to receive it for a month or six weeks after the sailing of the vessel. In this case, say “nevertheless the owners to have a lien on the goods for freight until paid.”

A master of a ship, on signing a bill of lading, ought clearly to understand he is only required to give a receipt for the cargo ; not to enter into a second agreement, hence the necessity of referring to the charter-party in the bill of lading for “freight and conditions” the bill of lading being the last document signed.

Always keep on good terms with your charterers, shippers, and consignees ; do any thing you can to oblige them consistent with your duty to your owners.

ALEXANDER SMITH, *Secretary,*
9, Villiers Street.

TERMS AND ABBREVIATIONS COMMONLY USED IN BUSINESS CONNECTED WITH SHIPPING.

A/c.	Account.	DEAD FREIGHT. The damage payable by one who engages to load a ship fully, and fails to do so.
C.	Currency.	DEVIATION, in marine insurance, is that divergence from the voyage insured which releases the underwriter from his risk.
\$	A dollar.	DISCOUNT, an allowance made for payment of money before due.
E.E.	Errors excepted.	POLICY, the document containing the contract of insurance. A <i>Valued Policy</i> is when the interest insured is valued. An <i>Open Policy</i> is one in which the amount is left for subsequent proof. In an open policy where the value shipped does not equal the value insured, the difference is termed <i>over insurance</i> ; and the proportionate amount of premium returnable to the insurer, is called a <i>return for short interest</i> .
E. & O.E.	Errors and omissions excepted.	PRIME, a small allowance for the shipmaster's care of goods, now generally included in the freight.
F.O.B.	Free on board (delivered on deck without expense to the ship).	PRO RATA, payment in proportion to the various interests concerned.
F.P.A.	Free of particular average.	QUID PRO QUO, giving one thing for another.
INST.	Present month.	RESPONDENTIA, a contract of loan by which goods in a ship are hypothecated to the lender, as in bottomry.
PROX.	Next month.	ULLAGE, the quantity a cask wants of being full.
ULT.	Last month.	
D/D.	Days after date.	
M/D.	Months after date.	
D/S.	Days after sight.	
%	Per cent.	
@ P Lb.	At per pound.	
B/L.	Bill of lading.	
AD VALOREM ...	According to value.	
AFFIDAVIT ...	Statement on oath	
AFFIRMATION...	Statement without an oath.	
AGIO	The premium borne by a better sort of money above an inferior.	
ASSETS	A term for property in contradistinction to liabilities.	
BANCO	A continental term for bank money at Hamburg and other places.	

697. MASTIC, a fine gum; specific gravity 1.074. In an action tried at Boston, U.S., in May, 1861, defendant who chartered the *Golden City*, had to pay for damage by mastic to a general cargo from New York to San Francisco, and for extra labour on discharge. The mastic was in cakes and stowed in bulk in the run of the hold. During the voyage it liquified, then hardened into a solid mass, and stuck to the sides of the ship and the goods next to it. At considerable expense it was broken out with drills and chisels. The article is manufactured at New York for use on fortifications, and when ship-

ped for Atlantic or Gulf ports in the United States gave no indications that heat in the hold would affect it.

698. **MATE.** The mate or chief officer is usually held responsible for any deficiencies in the cargo at the time of discharge, and he should therefore be careful to keep a correct account when loading; default on his part must however be proved against him. In the case *David G. Fleming* brought before the Court of Admiralty, the law was laid down by the judge very distinctly:—"It is the duty of the first mate, as is agreed on all hands, to receive and discharge cargoes. It is upon his responsibility, and the act which he performs in signing the receipt, that the master signs the bills of lading, thereby rendering his owners responsible to the consignees. This is undoubtedly a duty of the utmost importance, as the degree of responsibility the owners incur proves the obligation of the receipt given by the mate, on which the bill of lading is founded, the master not being supposed to know what is on board. The doctrine I mean to hold is, that the mate having signed the receipt, is responsible for the correctness of the signature, and that it is a certificate of the facts therein alleged; that he is bound by that signature, and if it should turn out afterwards that there is a deficiency in the *quantum* of cargo which comes to be delivered at the port, *unless he can show to the contrary*, I should hold that that deficiency he is responsible for." Sometimes, for the sake of dispatch, the mate takes an account on one side, and the supercargo on the other, and occasionally the entire duty is deputed to a youngster, while the mate is attending to something else. It will be of little use for him to say so in case of deficiency when discharging, for it may not relieve him from his responsibility. If the mate's presence is imperatively required in another part of the ship, his safe course will be to suspend the reception of goods during his absence. In the service of some large companies, all the officers are liable for deficiencies of cargo, and they make good conjointly. In other companies the chief officer is relieved from the duty altogether, and sometimes the whole responsibility falls on the supercargo. Overplus cargo belongs in reality to the shipper, but the rule is for the ship to deliver it to the consignee under the bill of lading, on payment of freight, and on the receipt of an indemnity against any claim by the shipper in respect to it.

699. All goods marked "this side up," should be so placed for their security, and to prevent after disputes. When packages are cut adrift for stowage purposes, obtain the shipper's written sanction, for if damage arise in consequence, the ship will be liable when the goods are landed. When goods are stowed loose or in bulk, and

there is more than one parcel, take care to keep them separate, as it frequently occurs that there is a difference in the quality although it may not appear so ; the ship would be liable unless the shipper gave his sanction in writing ; see grain, iron, manifest, &c. The management and dunnage of 'twixt decks and the necessity of properly securing the lower hatches, will be found under the headings general cargo, passengers, &c. The positions of the different articles in the hold should be noted in the cargo-book, or in a hold-book, and when there is a quantity of provisions for passengers, &c., a draught of the gauges of the casks, the number of barrels, boxes, &c., with the kind of provisions they contain, will be found very useful on the voyage. The use of a naked candle in the hold should be forbidden ; locked lights or safety lamps only are adapted for use there. Looking glasses or reflectors may be sufficient. Tobacco smoking is dangerous, and chewing leads to the injury of goods, such as marbles, silks, &c., from the expectoration which naturally follows. Sometimes the draught of water forward and aft is entered every morning in the hold-book or log-book while loading, and a note taken of the water in the well at the same time. If the ship begins to leak as she goes down in the water, it will then be known exactly on which line or seam the leak is ; this knowledge will be found very useful should the leak increase. The injury to cargo sometimes resulting from the practice of " salting " the frames of ships is referred to in the article salt.

700. The class of the ship should be considered when loading heavy cargoes, such as lead, iron, ores, &c., or screwed goods, such as cotton, hemp, wool, and hides. When dropping some heavy articles into the hold, the keelson is liable to injury, in which case it should be protected with a plate or slab of deal or some other wood. Before loading the timbers and pump-well should be well cleared ; and while loading, care should be taken that the masts are properly dunnaged, as by their working at sea, in heavy weather, damage frequently occurs. The pump-well requires to be protected, as leakage often happens here. Chain lockers, iron stanchions, bolts, bolt-heads, iron knees, &c., should have similar attention ; the heads of iron bolts have been known to work through five or six thicknesses of cloth, in unprotected bales, and the sharp angles of iron knees require to be especially avoided. Ballast port bars should have becketts fitted near, or some other contrivance to prevent their loss and the improper substitution of any stray pieces of wood, however unsuitable, in their places ; the insufficient caulking of ballast ports has often caused injury to cargo. Side scuttles, when

not required for light, can be well secured by putting a wad of oakum against the glass, and by fitting a piece of fir, tight in the cell, with battens all round the outside edge of the wood ; some masters parcel against the glass outside, and nail a piece of plank chamfered off at the edges ; tarred felt is better than parcelling, as it sticks closer to the sides : the loss of the ship *Dalhousie* is attributed to the insecurity of the scuttles ; she went down off Beachy Head, in October, 1853, when all but one man (REED) perished.

701. It is recommended that the *hatches* should be secured by being fitted as closely as is consistent with putting off and on with facility ; the seams between them as well as the combings of the hatchway should be well clinched or caulked with oakum, and tarred. Well tarred parcelling, three or four inches broad, should be laid over each seam. Two good tarpaulins stretched one after the other, over the whole hatchway, should be fitted within one or two inches of the deck, where they are to be secured to the combings by battens. A third tarpaulin will sometimes be useful to keep off any chafe which may arise from various causes. It may be necessary, while opening the hatches before bulk is broken, to hold a survey, in order to ascertain whether they have been properly secured, as should this not be the case, and damage through leakage have thus occurred to the cargo, it will have to be sustained by the ship, stress of weather notwithstanding. If in a dock, apply to the surveying officer, in other places to two master mariners with the master of the ship. "While the ship is in dry dock the whole of the steering apparatus should be carefully examined, and all defects made good. If the tiller ships abaft the rudder, reeve the chains *under* the barrel first ; but if the tiller ships before the rudder, reeve the wheel chains *over* the barrel first. Before the ship leaves any dock, harbour, or moorings, the officer should see that the wheel chains are clear ; the helm should be put hard over one way, and then hard over the other ; these are very important things to make sure of." Some of these subjects are not exclusively controlled by the chief officer, but they are nearly all connected with the preservation of the cargo, in which he is much interested ; see deficiency of cargo and lighters ; much of the information inserted under the heading master is equally applicable to the duty of the mate.

702. **Chain Stopper.** At Whitechapel, 12th August, 1852.—*Bentley*. A chain, part of a cargo, was lost through not having a stopper. The claim against the seaman was non-suited, and the mate declared liable.

703. **Not Answerable.** Where a master takes upon himself the responsibility of the mode of receiving cargo, that of the mate ceases. In June, 1856, THOMAS STAMPER, owner of the *Phoenix*, was summoned before the magistrates of

Sunderland for non-payment of wages due to JOHN CROFT, who signed articles as mate 6th December, 1855, for a West India voyage. The question raised was whether he was liable to a deduction of £12 16s. 5d., value of a hogshead of sugar. W. PORTS, master, said he warned CROFT that the loading apparatus was inefficient; a spar having been rigged in lieu of a derrick. The carpenter said the derrick he rigged was strong enough, and had lifted a hundred hogsheads when the master ordered the alteration; the mate cautioned them that he would not be answerable. The crew altered the derrick, and the warp broke in hoisting the first hogshead, which went overboard. The bench decided, that as the master ordered the alteration, the mate was not answerable.

704. **Alleged Liability.** Capt. P. HILMAN, ship *Robert Bright*, was summoned at the Thames Office, 25th April, 1857, by Mr. J. GILBERT, chief mate, who claimed a balance of £37 5s. 5d. on a voyage to Rio, Cape of Good Hope, Mauritius, and back to London. Mr. PELHAM said defendant had made a charge of £11 11s. 3d. for five casks of beer, alleged to be deficient, and £7 18s. 11d. for some posado plates, used in sugar plantations, which fell overboard accidentally, when cargo was discharging. Complainant said that he could not understand the accounts of the Rio Customs' officer, who was very negligent; directly the beer was landed it was taken away. He gave, as he believed, a correct account to defendant, was in bed whilst they were unloading. In consequence of a heavy swell, when heaving the bundles, the lighter rose under the sling, and the people not taking in the slack of the crane chain, the posado plates slipped out and went overboard; one was recovered by him, and the others by a diver, as he was informed. Defendant said he depended on the correctness of complainant's account. The loss of the plates was attributable to complainant's neglect in not securing the bales. It was a regulation at Rio to give the customs a manifest of the cargo, and if the discharge did not agree with it, a fine of 100 milreis and one half the value of the goods, was imposed. Mr. YARDLEY thought the loss of the bales could be recovered from the underwriters; it was a pure accident. As to the alleged deficiency, there was an inattentive Customs' officer, and complainant was discharging cargo while defendant was in bed—he should have paid more attention. No negligence was proved against complainant, who must be paid the full amount claimed, with 2s. costs.

705. **Wine Staved.** Thames Office, 11th February, 1858, Capt. EDWARDS, ship *Lady Kinnaird*, appeared before Mr. SELFE, to answer a demand for balance of wages made by Mr. KELLAND, chief mate. Mr. GOMM stated that the only item in dispute was £65 for a pipe of sherry lost at Madras, and which made the complainant a debtor to the ship of £44 18s. 4d. He would show that the cask was lost by an inevitable accident. The case set up by the complainant and his witness, WILLIAM WILLIS, a seaman, was that while four coolie men and others were unloading cargo, complainant went into the cabin to make out a hoat-note of the goods that had already been lowered into a boat alongside. It was rainy and misty, and a heavy sea was rolling. A pipe of wine was hoisted from the hold, and was high enough to be lowered over the bulwark into the boat, when the tackle gave way, the pipe fell on the deck, was stove in, and all the wine lost. In answer to questions, complainant said he received no orders to put guys and a yard-tackle on before the accident, which was caused by the rolling of the ship. After the accident, guys were used as well as a yard-tackle. Defendant said he gave express directions, before he left the ship, not to start any spirit casks without having guys to steady them in heaving up and putting the casks over the side;

the accident was owing to neglect of his orders. It was usual to put on guys and yard-tackle when hoisting heavy loads, and particularly casks from the hold. The second mate confirmed this evidence. Mr. PELHAM urged that complainant ought to pay for the wine lost by his negligence. Mr. GOMM : it was only an error of judgment. Mr. SELFE said defendant gave express directions in the morning for guys to be rigged and a yard-tackle put on, and as the sea was rolling, such precautions were absolutely necessary. Complainant had neglected his duty, in not taking these precautions. The use of the guys and other tackle was quite necessary, and the orders of defendant ought to have been obeyed. He considered under the terms of the articles, there was such an amount of negligence as to justify him in withholding the wages : he came to that decision with very great reluctance, because complainant had hitherto maintained a high character for ability and good conduct. The summons must be dismissed.

706. **Clerical Error.** Mr. CORNER, owner of the *Ion*, appeared at the Thames Office, 3rd January, 1858, to answer the summons of J. TOSSELL, late chief mate, who sued against the master, W. G. HUDSON, for £20, balance for services, London to Quebec and back to Chatham. Mr. CORNER said he had paid £61 14s. 10d., for bars of railway iron not received, but which the mate entered as having been received, and when the iron was delivered at Quebec, there appeared, according to the bills of lading, 42 more on board than were actually received. The master accordingly drew a bill which was paid. The stevedore's foreman told the mate that he had made a mistake, and that he, the foreman, who was also taking tally, had made 42 less ; the mate insisted that he was correct, 42 more bars had been entered in the manifest and bills of lading than had been received. Mr. YARDLEY, the magistrate, thought Mr. CORNER had encountered no liability and ought not to be called upon to pay ; as much was delivered at Quebec as was put into the ship here. Mr. CORNER : yes, but on the mate's tally and in the bills of lading it appears that there were 42 more on board, and the consignee, not receiving them, claimed the value which was paid. Mr. YARDLEY : he ought not to have taken advantage of a clerical error. Mr. CORNER : this is not an ordinary case ; the mate was in liquor, or the mistake would not have occurred. MATE : no, no, now take care. Mr. CORNER asked if the mate, who was paid high wages, and took in the whole cargo, was not responsible ? the stevedore's man was sensible of the error, and said there were 42 less on board than the mate stated. Mr. YARDLEY : that evidence would, in my opinion, be sufficient if an action was brought. Mr. CORNER : but unfortunately all the documentary evidence is adverse ; the mate has made it appear there were 42 more on board than were actually received. The MATE : that is a mistake of mine ; as many went out as came in. Mr. CORNER submitted that the wages ought to be withheld to remunerate him in part for his loss. Mr. YARDLEY could not do that unless it were shewn there was culpable negligence ; he could not stop a mate's wages for a mere clerical error. Mr. CORNER presumed they were in perfect darkness about the iron. It could not have been eaten. The mate preferred his own tally to that of the stevedore's foreman ; the master was obliged to take his receipts. Mr. YARDLEY : the mate might be punished for a loss, which, after all, no one had sustained. Mr. CORNER : I have taken the greatest possible trouble about this matter, and notwithstanding I had to pay. Mr. YOUNG : (for the mate) in your own wrong. Mr. CORNER : I could not help myself. Mr. YARDLEY : represent all the circumstances to the merchant, and no doubt you will get the money back. If the 42 bars were not put on board, and

there can be no doubt they were never received, the merchant cannot have sustained loss. Why was the money paid? Mr. CORNER : the agent at Quebec drew on me. Mr. YARDLEY : what obligation was there to accept? Mr. CORNER : I accepted, as I do all bills in commercial transactions. Mr. YARDLEY said it was no wonder he felt grieved, but the wages could not be withheld for a mere error. He was only surprised that anyone should take advantage of what was palpably a mistake, and asked the owner to pay that which was neither legal nor equitable. Mr. YOUNG : you will give us costs? Mr. YARDLEY : no, 2s., the cost of the summons only ; it is not a case in which I should be justified in saddling Mr. CORNER with costs. The £20 was paid and Mr. CORNER said he should not be able to obtain re-payment ; it had never been done ; he should apply to the Local Marine Board, to enquire into the mate's conduct.

707. On this the *Shipping Gazette* observes, 15th January, 1858, Mr. CORNER's case is unquestionably a hard one and should be a warning to owners against too hastily assuming a liability they may never really have incurred. If the master were certain that he delivered all the bars shipped, and the stevedore's foreman at the port of shipment could testify to the number of the bars shipped being the same as the number delivered, Mr. CORNER could not legally have been held liable for one shilling, notwithstanding the incorrect tally of the mate. The tenor of the evidence before Mr. YARDLEY was in favour of the mate, in point of law, and led to the conclusion that the sum paid by Mr. CORNER was the voluntary assumption of a debt, of the existence of which the court had no evidence ; or, as Mr. YARDLEY said, the satisfaction of a demand which the owner was neither legally nor equitably bound to pay. There is no question that a mate, like any other servant, may be held responsible for the consequences of gross and culpable negligence, or that he may be severely punished for drunkenness, resulting in loss or injury to his employers, or to anyone else.

708. **Beer.** A chief officer writes to the *Shipping Gazette*, 22nd November, 1858,—“ I took in a general cargo in London for Algoa Bay. When discharged there was missing a case of beer, value £1 18s., which I suppose I must pay for. The second officer and carpenter were in the hold slinging, and on six or seven occasions, the master also. They gave me the marks and numbers. It is possible that the master or second officer may have made the mistake in not giving me the whole of the marks and numbers, as generally there were as many as six or seven cases slung and hove up at a time, to go over side into a lighter ; and during the work we were three men short. Having to assist all I could, I think it rather hard for me to pay the entire loss. I would be quite willing to pay half.” The editor answers—“ under the circumstances stated, the chief mate ought not to be saddled with the whole consequences of a loss which might possibly have occurred without any default on his part. Where casks are delivered over the ship's side into lighters, care should be exercised in counting them as they are being delivered.”

709. **Mobile Cotton.** At Houghton, in April, 1859, WM. GRAY, mate of the *Peter Maxwell*, summoned the master, Mr. MARSHALL, who pleaded that a bale of cotton had been lost through complainant's default, and the price ought to be subtracted. The mate had taken in 2,919 bales at Mobile, and when they were landed at Liverpool one was missing. The consignees, Messrs. FERNIE, held the master liable, but he urged that it had been stolen through the mate's neglect. A witness from Messrs. FERNIE, stated that only 2,918 bales had been taken from the quays, and that all delivered from the ship had been removed ; but the return

presented to the Customs, showed that the number received was 2,919 bales, and the mate obtained his wages in full.

710. **Rum.** Capt. CRISPIN, *Oribs*, appeared before Mr. SELFE, London, 23rd April, 1859, to answer the claim for £16 17s., of his chief officer, Mr. WILEY, who stated that when in the West Indies they were hoisting in puncheons of rum by can-hooks with a guy tackle on the yard to steady them. Defendant ordered slings instead, and when hoisting the second cask with slings, they slipped just after the cask was over the side, and it fell on the deck; the head came out and the rum flowed away, excepting about 15 gallons which were sent ashore to the wharfinger. Verdict for the mate.

711. **Iron.** Before Mr. SELFE, London, 6th January, 1861, Capt. STAPLETON, ship *Rangoon*, appeared to answer a claim for wages, made by Mr. CURTIS, late chief mate. Mr. GOMM was for complainant; Mr. STODDART for defendant. In the ship's account complainant was brought in debt, and there was a deduction of £36 for iron said to have been lost by his neglect. It appeared that complainant joined in the Prince's Dock, Liverpool, 21st December, 1859, and that the iron was taken in very quickly, and 2,500 bundles were received before complainant joined, and he had no means of ascertaining whether it had been accurately tallied or not. While complainant was acting as mate, cargo was taken in at the same time from a cart on the quay, and from a lighter in the dock, and it was impossible for him to look after both. Regarding the 2,500 bundles taken in before he joined, he had only the shipkeeper's word. Mr. GOMM contended that negligence could not be shown. Complainant said: When I went on board the master asked who was keeping tally, to which the shipkeeper replied, one of the men in the lighter. I was informed by the lighterman there were 2,500 bundles of iron on board. There were 1,800 bundles of nail rods taken on board. The carpenter first took tally, and then the second mate. At Singapore I tallied out cargo, but I did not superintend the whole delivery. The second mate assisted once: I signed for the whole cargoreceived at Liverpool, including the 2,500 bundles taken in before I came on board. Mr. SELFE; how came you to do that? I did it at the master's request. Mr. SELFE; then you ought not to have done it at his or anybody else's request; you see the consequences of doing it. They try to make you responsible for the whole loss. You should have said, I will sign only for what I have received and no more. Complainant: the master said he never knew bundles of iron to be short; the owner was close to him at the time. Mr. STODDART said that a deficiency was discovered in that part of the cargo last taken in under the superintendence of the mate, and what was more particularly complained of was his frequent intoxication at Liverpool and the neglect of his duties. Mr. SELFE: it must be shown that it was by the mate's carelessness or negligence there was a deficiency. It would be preposterous to say that complainant was liable for all the deficiencies when a good deal was taken before he came. If owners wanted such an unreasonable thing as to require mates to guarantee the payment for all losses and deficiencies, they must say so in the articles of agreement. Mr. GOMM: called attention to the fact that the mate did not sign articles until 27th January, and that the magistrate had no jurisdiction over anything that transpired before that time. Mr. SELFE: you are quite right there. Mr. STODDART said there was a deficiency in the part of the cargo taken in after the complainant signed articles. Mr. GOMM: it is quite impossible to raise the distinction whether there was a deficiency in cargo taken in before he signed or afterwards. The mate was then cross-examined by Mr. STODDART, and said defendant complained only once of his

being intoxicated. Mr. SELFE : did the master complain of your being intoxicated after you signed articles? Complainant : afterwards. Mr. SODDART handed a book to the complainant and said, who made these alterations? Complainant : I made them at the master's request. Mr. STODDART : was the alteration made before or after the deficiency was discovered? Afterwards. Mr. STODDART : our case is that the complainant did not take in the cargo correctly at Liverpool. Mr. SELFE : it don't matter how the cargo was delivered at Singapore, if there was a deficiency at Liverpool. The question is whether the iron was lost, stolen or mislaid, or whether any negligence is attributable to the mate. After what has transpired it would be absurd to ask me to make the whole loss to fall on him. Defendant was sworn, and spoke to the drunkenness of complainant at Liverpool, and also that some irregularities occurred on the part of the mate as regarded the delivery of the cargo at Singapore. He believed the deficiency arose out of the mate's drunkenness while he was taking in the latter portion of the cargo, and that it was in the last lot that came. Mr. SELFE did not think it possible for the defendant to distinguish what particular bundles of iron were or were not delivered ; there were no particular marks. If hogsheads of sugar, each bearing some distinctive mark and number, had been missing, it might have been ascertained who received a portion one day and who on another. Complainant was culpable to some extent in being intoxicated while on duty, and some loss may have arisen from his laches. He could not, however, make him liable for all. Mates of ships did not guarantee masters and owners against all losses ; if called upon to do that there would be no mates. He should make the mate suffer to some extent, and therefore deduct £7 from his wages. His order was for payment of £25 without costs.

On this case an experienced master says, "It appears astonishing that Mr. SELFE should have made the mate liable at all. The master and owner charge the mate with frequent intoxication and gross neglect of duty at Liverpool *immediately* after joining the ship ; and deliberately allow a man of that character to proceed on a voyage extending over 12 months. Where the remedy was distinctly in their hands prior to the commencement of the voyage, and moreover when it was their bounden duty to have dismissed him and reported to the Local Marine Board, and to have shipped a competent man, the whole of the expense and inconvenience resulting from their want of caution and care in the selection of good officers, should be retorted justly upon themselves."

712. **Dantzic Timber.** Thames Office, 20th June, 1861, Mr. KING, chief officer, sued Capt. A. SMITH for wages, £7 *or* 10*d*. The *Palmyra* loaded timber at Dantzic, where it came down in large rafts. The chief officer had to count the pieces and give a receipt to the person who brought them. A stevedore and three of the crew received the timber. The mate's counsel argued that in the midst of his various duties he could not tally the sticks, neither was he expected to do so by the master. His only course was to count the rafts every night and infer that the rest was on board. The ship was removed from one side of the river to the other, away from the rafts, and the pieces were floating about. It was impossible to say whether the ten necessary sticks were lost there or on discharge in the Surrey Canal, where they also floated about *ad infinitum*. The master's counsel said that the mate signed receipts for more timber than was in the ship ; the loss was £15. The magistrate, Mr. WOOLRYCH, decided that it was a case for compromise, and awarded the mate £4, and one guinea costs.

713. **Currants.** In 1863, a steamer discharged a cargo of currants in the

London Docks. One lot of 30 barrels of the same mark was missing, and not one package corresponding with the marks and numbers could be traced as having been landed on the dock quay or put overside into lighters. The Greek merchant laid his claim for the value, producing the bill of lading. The mate's receipt in master's possession, and entry in the cargo-book agreed with the bills of lading. The steamer having been laid up immediately after discharge, the mate had left her prior to the claim being made, but when sent for and questioned, could not deny his signature, and believed he had taken the currants in. It afterwards transpired that the lot in question had been left in the lighter at Patras, and sent alongside another steamer, taken in and landed in England. The mate finding the lot mentioned in the boat-load, had unthinkingly filled out his receipt including the disputed quantity. There was an assumption from the first that such was the case, and that the merchant or consignee presenting the bill of lading suspected or knew of the error, and felt that equitably there was no claim. Subsequent advices from Patras confirmed the idea.

714. **Cotton Missing.** The *David G. Fleming*, Admiralty Court, 12th November, 1863, before Dr. LUSHINGTON. JAMES FORBES, late mate, sued for his wages on a voyage from Liverpool to Melbourne, thence to Bombay, and back to Liverpool. His claim was resisted by the owner in part on the ground that three bales of cotton were missing and unaccounted for by the mate, who gave the following receipt at Bombay.

"RECEIVED on board the ship *David G. Fleming*, bound for..... from.....
 "the following packages in good order and condition, 98 bales of cotton,
 "and two in dispute."

The master signed bill of lading according to the course of business.

In delivering judgment, the judge said, "It is the duty of the first mate, as is agreed on all hands, to receive and discharge cargoes. It is upon his responsibility, and the act which he performs in signing the receipt, that the master signs the bills of lading, thereby rendering his owners responsible to the consignee. This is undoubtedly a duty of the utmost importance, as the degree of responsibility the owners incur proves the obligation of the receipt given by the mate, on which the bill of lading is founded, the master not being supposed to know what is put on board. The doctrine I mean to hold is, that the mate having signed the receipt, he is responsible for the correctness of the signature, and that it is a certificate of the fact therein alleged; that he is bound by that signature, and if it should turn out afterwards that there is any deficiency in the *quantum* of cargo which comes to be delivered at the port, unless he can show to the contrary, I should hold that for that deficiency he is responsible. It is said there ought to have been enquiries made at Bombay; but how could the mate, who signed the receipt for these articles, with any degree of hope or expectation that there could be a successful issue, demand the three missing bales in the teeth of his own receipt, and in the teeth also of the bill of lading? It has been suggested that without any fault or negligence on the mate's part, the three bales may have been stolen, but there is not a word to support that proposition. It appears to me the obligation and responsibility rests entirely with the mate, and I think the case of the owners is established. I understand they have paid into court all the wages, less the amount in contest, viz., the value of the goods which they have already paid the consignees of the cargo; and, looking at all the facts, I cannot hesitate in saying, for a single moment, that it is my duty to pronounce

for the tender, and against the further claim made by the mate. I give the costs up to the time of tender."

715. Boiler Plates. The master of the ship *Medway* was summoned, in March, 1864, by the chief mate, to answer a claim for wages of £16 15s., from which £10 had been deducted for loss of cargo. The ship, outward bound to Calcutta, took in a number of boiler plates, amounting as per mate's receipt and bills of lading, to 900. On delivery, eleven plates (£36) were short, but the owner consented to lose £26, and deduct £10 from the mate's wages. The articles of agreement, in addition to the ordinary liability incurred by the mate, had a clause confirming this liability, but this clause was pronounced by the magistrate to be a "mere surplusage." It was admitted by the master that the *Medway* was taking in cargo at Calcutta at the same time as she was discharging, that the boatmen there are notorious pilferers, and that the ship was discharged some 600 yards from the shore. The mate said: "I took in the iron plates in the West India Dock. I did not deliver the whole. I had to see the dunnage of the ship laid for the other cargo, and to look after cargo coming in, while the other cargo was going out. Defendant gave me particular directions about the dunnage." The magistrate looking to the liability of the mate, as imposed by the articles, concluded that to fix him with responsibility, it was necessary to show he had been guilty of embezzlement, neglect, or incompetency—at all events, that neglect or incompetency must be proved before a mate or seaman can be deprived of his wages. Neither had been proved, and he decreed for all the wages claimed, and one guinea costs.

716. Walnut. In the Thames Police Office, before Mr. PARTRIDGE, 28th March, 1864, Capt. R. BOVEY, ship *Eugenia*, was summoned by H. M'GREGOR, chief officer, for balance of wages £14 6s. 6d. Payment was resisted through the deficiency in London of seven out of 585 pieces of walnut-tree wood taken in at Genoa and valued at £17 10s. Mr. PARTRIDGE said that in this case no "embezzlement, negligent loss, or destruction of ship's stores," had been proved; he ordered payment of £14 6s. 6d., with one guinea costs. By the evidence it appeared that in the articles the mate made himself liable for any "wilful or negligent loss or destruction of any part of the ship's cargo or stores," that his undivided attention was given to the reception and discharge of the cargo, and that there was only one hatchway open. The magistrate's decision excited much comment among the mercantile community.

717. Sugar. Common Pleas, 1st June, 1864, before Mr. Justice BYLES, Mr. M'GOWAN, chief officer of the *James Gibson*, sued for £56 1s. 4d., balance of wages, which was detained because the owner had to allow £160 for 71 bags sugar, part of a cargo shipped at Swatow and discharged at Shanghai. The sugar came off in boats and was received by the mate, but stowed under the superintendence of the master, who was frequently ashore at Swatow. It was discharged by coolies, who took three weeks; many were about the ship, which was short-handed. One man was kept at the anchor watch while in the river. The hatches were off by day, and not fastened down by night. Verdict for mate.

718. A Bale. In the Liverpool County Court, 18th July, 1864, before Sergeant WHEELER, Mr. GUNN, chief officer of the ship *Ralstone*, sued Mr. M'ARTHUR for £27 5s. wages and £50 damages. The mate gave a receipt to the master for 24 bales of goods shipped in the East India dock; 23 only were delivered at Shanghai. The cargo was discharged into lighters worked by the natives, said, by the mate's advocate, to be "the biggest scoundrels in the world."

The second mate and four seamen had deserted, the cook was intoxicated and attempted to strike the master. GUNN was superintending the discharge of the cargo, but went to the captain's rescue, and requested the man in the gangway to stop the discharge. He was absent about twenty minutes, and notwithstanding his request, five or six bales were discharged. He wanted to have the bales placed on board again, but the master would not allow it. Judgment for plaintiff for £17 5s.

719. **Bad Conduct.** Mr. COLMAN, in his letter dated 18th February, 1865, says : In the Thames Police Court, London, 1st September, 1864 (reported in the *Shipping Gazette*, 2nd September), in which the master of the *Lady Cecilia* was summoned by the mate for £50, balance of wages; the master had deducted £17 2s. for bad conduct, reducing wages from £6 6s. to £2 16s., or in other words, disrating the man from mate to A.B. The magistrates held that the mate being in possession of a certificate of competency granted by the Board of Trade, it must be taken as evidence of competency, and that the master had no authority to over-rule or reverse the decision of the Board of Trade or an officer's competency. The opinion of the Attorney-General and Solicitor-General is in the *Gazette* of 3rd December, 1864.

720. **Deficiency.** Thames Court, 5th April, 1865, before Mr. PARTRIDGE, Capt. GEORGE BROWN, *Royal Arthur*, was summoned by Mr. JOHN OWEN, chief mate. Complainant signed receipts for 9,552 bags linseed shipped at Calcutta, and only 9,513 were delivered in London, for which deficiency £44 was charged. The case of the *David G. Fleming* was quoted against him. The mate's solicitor, Mr. YOUNG, said the case read was from a newspaper report of which the magistrates could take no notice. If no neglect could be shown there was no liability. Complainant stated that he tallied in 9,552 bags seed, 5,000 bales jute, 700 or 800 bags sugar, and a large quantity of saltpetre. He did not tally out. He was then taking in cargo in London at the main hatch, while cargo was going out at the fore and after hatches. The master told him to look after the cargo coming in. Mr. PARTRIDGE said the report shewn him was not enough to satisfy him what the decision of Dr. LUSHINGTON was, viz., that the mate of a ship was bound by his signature. He had signed for 9,552 bags, and had produced no proof of the loss of 39. Defendant said that the owners had paid for 45 bags, and seven were afterwards found in the docks. Mr. YOUNG : hear that, sir ; others may be in the docks. Mr. PARTRIDGE decided in favour of complainant.

721. **Broaching Liquids.** In the Thames Police Court, 21st December, 1866, Mr. THOMAS ROBSON, mate of the ship *Valdivia*, sued Capt. JOHN CLEMENT, for balance of wages £26. It was sought to make complainant a debtor for £38 for alleged deficiency amounting to £62. There was no entry in the official log-book. The mate had duly reported that some cases of wine and spirits had been broached by the crew. When he was engaged at the main hatch unloading cargo in China, where thieves abound, some goods were at the same time sent out of the fore hatchway ; he could not attend to both. The master said he made himself responsible for the loss of beer, and charged the mate only with the deficiency from the cases of wine and spirits. Mr. PARTRIDGE : how do you know they ever came on board ? Capt. ROBSON : by his receipt for 101 cases, and 21 not accounted for. Mr. PARTRIDGE : do you know what became of them ? Witness : no. Mr. PARTRIDGE : you cannot charge the mate with the loss. It is not because things are lost on board ship that a chief mate is chargeable. You must prove carelessness or culpable negligence. The second mate's evidence was given rather loosely ; he

discharged some beer, but no cases. On being questioned closely, he said, "some cases did go out of the fore hatchway but 'not at that time.'"—a term for which he gave no explanation. Judgment for £24 17s. 6d. for the mate, and 21s. costs.

722. MATS. 9'444 tons of 400 pieces Archangel, weigh 8½ tons, and occupy 1 keel or 850 cubic feet; from Archangel they are freighted 5 ¢ cent. less than hemp, for any quantity not exceeding one-sixth of a ship's cargo, reckoning 400 pieces double and 500 single to a ton.

723. MEDITERRANEAN FREIGHTS. In the table of the London and Mediterranean Proportionate Rates of Freight in practice, at the commencement of this work, the fair proportion is taken on the register tonnage of vessels, with due regard to their average burthen; reckoning 97 quarters of wheat to a keel of 424 cwt. with 5 ¢ cent. additional for dead-freight. Usually 97 quarters of wheat weighing from 60 to 62 lbs. ¢ bushel, are considered equal to 1 keel of coal weighing 21 tons 4 cwt., (424 cwt.) or to 10 tons of clean hemp or flax. It is customary that all mats, wood, sticks, rattans, &c., necessary for dunnage, stowage, or the preservation of goods, should be free of freight. When ballast is required for a cargo of light goods, such as wools, madders, corks, &c., if the ship be ballasted with heavy goods, the freight on the same should be only one-third of the rate payable on a full cargo of the like description of goods. The Mediterranean rates of freight do not apply to what are termed general cargoes.

724. METAGE. When the mode of payment is not inserted in the charter-party, it is the general custom for the ship to pay one-half and the receiver of the cargo the other half.

725. METALS of every description should be stowed under and separated from, goods liable to be injured by contact. Bundles of sheet iron, rods, pigs of copper or iron, or any rough hard substance, should not be allowed to come in contact with bales or bags, rope, canvas, felt, or any soft packages liable to be chafed.

726. Capt. PARISH says, "if a column of spelter, tile, copper, or any other easily-moved dead-weight is built up near the after scuttle, it will be found very convenient for trimming ships at sea and save much labour. Copper dross is excellent ballast for ships, but care should be taken that it does not come in contact with the iron water tanks so frequently fitted in the hold, for the tanks have sometimes been destroyed by the copper dross."

727. Much experience is obtained in steam-ships regarding the injurious effects of metals and of their liability to injury by contact

with other substances, or with each other. Formerly marine boilers were laid on a close platform of wood, with the view chiefly of preventing the bilge-water, in wooden ships especially, from washing up to and corroding the plates. It was found however, that if a leak occurred in the bottom of the boiler, the brine diffused itself for a large space between the bottom plates and the wooden platform, causing great corrosion. The usual practice now is to rest the boilers upon iron keelsons, the bottoms being thus left comparatively open for examination and painting, and for small repairs. In this case the bilges under the boilers must be kept quite clean and dry by the bilge pumps. Pipes attached to bilge pumps should be made of lead, which suffers less corrosion than copper, from the acidulous bilge-water of wooden ships.

728. In a copper fastened ship the *upper* sleepers on which the boilers rest should be bolted to the *main* sleepers, with iron bolts, as instances have occurred where the boilers have lain in juxta-position with the heads of copper bolts, that a hole has been eaten by galvanic action through the bottom of the boiler over *each* bolt. The sleepers ought also to be sheathed on the top with sheet zinc, before lowering the boilers in place. Injurious effects are caused to the shells of marine boilers by the use of copper blow-off pipes, feed pipes, &c., notwithstanding the intervention between the flanges, of sheet lead or zinc washers with canvas and white and red lead cement joints, &c.

729. It is necessary, both in marine engines and boilers, to guard against the destructive effects of *galvanic action* which ensues in all cases where the two metals of different degrees of solubility (or possessing different degrees of affinity for oxygen) are placed in juxta-position, as for instance iron and brass, when the former metal suffers a rapid corrosion from being the more oxidizable of the two, while the brass is quite protected. The same destructive effect is produced in all other parts of machinery where copper or brass remains in contact with iron; but this proceeds more rapidly when sea-water or moisture of any kind is present, and according as the temperature is greater. In the case of paddle engines, the wheels present a convenient leverage for moving the engines, by hand; but with the screw, much difficulty is sometimes experienced in effecting this, and it has generally been found requisite to fit some mechanical contrivance for the purpose. One of the principal duties of an engineer, whilst in harbour, is regularly to move the engines round through a portion of a revolution, in order to change the relative positions of all bearings or touching surfaces. It is found, that when the iron piston-rod, for example, remains for even a day or

two in contact with the brass gland, a slight though perceptible furrow, is eaten in the rod by the oxidation of the metal, induced by the galvanic action which results from the contact of the brass and the iron. In the Royal Navy, engineers are instructed (when the ship is in harbour and remains at anchor any length of time) to turn the engines partly round every day, and note the fact in the engine-room register; and captains are instructed to have the capstans turned round and properly oiled once a week.

730. As oxidation is promoted by heat, the boiler in steam-vessels should be kept as far as possible from those parts of the vessel which are above water, or means should be adopted to keep them cool by interposing non-conducting substances. The plates in other respects in the engine-room do not appear to be more liable to corrosion than the rest, thus exhibiting a result different from that which was expected. Care should be taken not to connect copper pipes to the shell; to avoid this, some add short lengths of wrought-iron pipes, with flanges, rivetted to the vessel.

731. The retention of coal in iron bunkers, if these are likely to be influenced by moisture, and especially when by any accident, wetted with sea-water, will cause a speedy corrosion of the iron with a rapidity proportionate to its more or less efficient protection from corroding influences. This corrosion seems due to the action of carbon or coal forming with the iron, a voltaic couple, and thus promoting oxidation. The action is similar to that of the tubercular concretions which appear on the inside of iron water-pipes, when a piece of carbon, not chemically combined with the metal, and in contact with saline waters, produces a speedy corrosion. Where the "make" of iron shows it liable to be thus corroded, a mechanical protection is generally found sufficient. This is sometimes given by Roman cement, by a lining of wood, or by drying oil driven into the pores of the iron under great pressure.

732. In 1856, Mr. MARSH, a chemist, discovered that it was an invariable rule with iron which has remained a considerable time under water, when reduced to small grains, or an impalpable powder to become red hot and ignite any substance with which it comes in contact. This he found by scraping some corroded metal from a gun, which ignited the paper containing it and burnt a hole in his pocket. The knowledge of this fact is of immense importance, as it may account for many spontaneous fires and explosions. The tendency of moistened particles of iron to ignite was discovered by the great French chemist LAMERY, as far back as the year 1670. Under the headings iron and iron ships there is much information which refers also to metals.

SPECIFIC GRAVITY—METALS, SOLID.

	Cubic feet.	Specific gravity.		Cubic feet.	Specific gravity.
Brass, cast	487 to 524·4	7·8 to 8·4	Iron, cast, aver'ge	444·	7·11
- wire	533·	8·54	- wrought do.	480·	7·69
Bronze	524·	8·4	Lead	712·	11·4
Copper, cast.....	537·	8·6	Tin	456 to 468·	7·3 to 7·5
- sheet.....	549·	8·8	Zinc	424 to 449·	6·8 to 7·2
- hammer'd	556·	8·9			

733. MILLSTONES ; see stones.

734. MIRABOLINES or MYRABOLANES. Dried wrinkled fruit of various specifics of the *Terminalia*, used by tanners and dyers. Bengal, Madras, and Bombay ton 16 cwt.

735. The barque *Benjamin Buck Greene*, Capt. JAMES BAWDEN, belonging to Messrs. BLYTH, GREENE, & Co., of 15, Philpot Lane, London, loaded at **Bimlipatam**, in 1869, and sailed on the 17th May. Her cargo consisted of

308 Tons Jaggery,	8 Chests of Bees' Wax,
3,493 Bags Mirabolines,	30 Casks and 200 bags Tamarinds,
2 Cases Curry Powder,	76 Bales Skins, and
7 Tons Deer Horns,	8 Tons Coir Yarn.
840 Bags Niger and Gingelly seed,	

The dunnage, 10 tons of light-wood, was six inches deep on the floors ; nine in the bilges, and say four against the sides up to the deck, which consisted of wood, or horns, and hurdles, with which the the ship was provided in London for sugar cargo. The ballast, 328 tons jaggery and tamarinds, was spread from bulkhead to bulkhead. [It is a good plan to taper off from either end so as to raise the jaggery, being very heavy. If there is much of it, it makes the ship very stiff and laboursome when fairly levelled fore and aft.] The bees' wax, skins, &c., were aft by themselves in the 'tween decks, with hurdles and mats against the sides and bulkhead to keep them free from chafe and rust. The *B. B. Greene* is yacht built, she registers 528 tons, is 128·9 feet long, 30·5 broad, and 20·5 feet deep. On departure with this cargo her draught aft was 18 feet 10 inches, forward 17 feet 8 inches, and on arrival at home, 25th October, 1869, about 18 feet 6 inches and 17 feet 3 inches. Her best trim at sea is 14 inches by the stern ; with 735 tons Cardiff coal 19 feet 5 inches and 18 feet 2 inches. Her **port charges** at Bimlipatam were inwards 1 anna $\frac{1}{2}$ ton, outwards bass' lights. Pilotage nil. On the Madras

coast the **season of shipment** is all the year round, chiefly January to May.

736. The tamarinds and jaggery were well matted over to receive the mirabolines which occupied a considerable portion of the hold throughout. The niger and gingelly seed were placed in the 'tween decks abaft the main hatchway, and reached as far as the bulkhead aft. Bees' wax, skins, &c., in the 'tween decks, aft by themselves, with hurdles (something like the side of a crate) and mats on the bulkhead and sides to avoid chafe and rust.

737. In reference to the mirabolines, Capt. BAWDEN says—
"Being a wild berry, like our acorns, they are thought of such little consequence that they are not even cultivated but allowed to grow wild; they can take no harm when they get wet coming through the surf. On the Madras coast they occupy less space than those shipped on the Bombay coast, in consequence of which many masters coming from Bombay to Bimlipatam to load, express themselves dissatisfied with the Bombay schedule rate. Myself and the master (Capt. T. GIBBS) of the *Benefactress*, of 1,200 tons, of Liverpool, stacked various quantities and found that 16 cwt. occupied a less space than the cubic ton of 50 feet, even when loosely stacked on deck, without taking the trouble to bind them closely together. All goods shipped at Bimlipatam in bags weigh 164 lbs. net, whether seeds, sugar, mirabolines, or anything else, the bags being specially made for each particular kind of goods, to hold that quantity, and *cannot possibly* contain more, or be *full* if containing less, as the boats are of a peculiar sort, and cannot carry more than a certain complement, which is 35 bags each, so that the merchants are very particular as to the weight. The bags, I should say, did not weigh more than 2 lbs. Taking 13 as a measurement ton of 50 cubic feet for freight, the weight will be 2,132 lbs.—14 would be a ton of 20 cwt. On the Coromandel coast the bags are of single gunny cloth and are made in Calcutta; although very inferior, and consequently involving more waste by the breakage, the merchants prefer them to superior bags of British manufacture, the difference in the price being so great. A ship taking in about her ballast tonnage of jaggery can always fill herself with seed and mirabolines, horns, coir, &c. Ships going in ballast to load at Bimlipatam, if of *sand*, can proceed to the inner anchorage and throw it overboard there, but if stone ballast they must anchor outside a depth of ten fathoms and throw over there, which occasions a little detention. Stone ballast *will not* sell at Bimlipatam. Labour is very cheap—seven annas $\frac{1}{2}$ day each man; they come on board on Monday morning

and stay until Saturday night. Boat hire one rupee each way to the inner anchorage, and two rupees each way to the outer. Under the heading seeds, there will be found some more information regarding ships trading on the Madras coast.

738. MOLASSES or MELASSES, in Portuguese *Mel de assucar* or *melão* from *mellatium*, a low Latin derivative of *mel*, honey, signifying according to NONIUS, *must* concentrated to half its bulk, is the syrup or mother-water that is separated in the course of manufacture from the crystal or grains of raw sugar : it drips from them like honey from the comb, a circumstance to which it no doubt owes its name, and especially to its likeness to honey in taste, consistency, general appearance and uses. The name is sometimes given to *treacle*, which as distinguished from molasses, is the syrup separated from the lowest boiling in refineries of sugar, or from the "bastard" obtained in sugar houses by boiling imported molasses. The deposit of sugar which frequently settles at the bottom or in the bilges of the casks during the voyage, is called *foot*.

739. No dunnage is necessary for molasses, excepting beds and chocks to keep the bilges of the casks free ; care must be taken to avoid a "falling short in the longers." The ground tier should be straight fore and aft, each side the keelson, and the heads separated by about an inch ; this is done to save the length in the second and third tiers. In placing the ground tier the "breakage" caused by the masts is omitted and filled with wood ; to avoid "crossing the heads" of the casks, each cask should be carefully bedded and chocked. The first tier of riders is stowed the same way, observing that the casks rest fairly on the ground tier, so as not to have the entire weight on any one point. The third is placed empty, bedded and chocked, and there filled by a hose. Four heights are occasionally taken. Shipowners have often to pay heavy damages for leakage arising from stowing too many heights without an intervening platform or 'twixt decks. When filling in the hold much "muck" prevails, and the hogsheads become smeared with dirt. After each tier is filled, some masters wash down with buckets of salt-water, which cleans the casks and tightens the quoins. Molasses weigh about 30 lb cent. more than rum, and the weight increases if no loss arises from leakage, to which it is very liable. Spile-holes are sometimes left open, with a yarn put in to admit of fermentation ; occasionally, when the hogsheads are well quoined, the bungs are left out altogether ; the quantity which weeps from West India hogsheads on the passage home is computed by some at 15 lb cent. An experienced Liverpool firm states that the loss arises more

frequently from defective casks than from defective stowage ; if masters would insist on having the puncheons iron-bound, that is with four iron hoops round each, there would be much less loss.

740. In consequence of their slippery condition, through the waste and muck, hogsheads of molasses have been known to turn round, on the passage home, when stowed on their bilges, and to waste their contents through the bung-holes. To avoid this a rope has been laid the whole length of each tier, and firmly nailed to every cask. Some masters, where it is practicable, prefer stowing them on their heads, in the half-deck, or 'tween decks, in which case sand or some other material is first laid, so as to relieve the head from undue pressure near the chimes. To allow for evaporation, a number of small holes are bored in the upper head, which will never be filled by the escaping molasses ; by these holes it will return to the cask immediately fermentation has ceased. In this case it is absolutely necessary that the bungs should be secured by a plate firmly nailed on them, or by some other efficient means.

741. In August, 1865, a barque of 430 tons register, loaded molasses at **Oardenas**, in the Island of Cuba. She was 113 feet long, 30 broad, 19 feet 8 inches deep ; 'tween decks six feet ; and is termed a crank ship, having a great depth to her length. Her cargo, a full one, was equal to 800 hogsheads and consisted of 735 hogsheads, the remainder casks ; some of the hogsheads contained 150 gallons and weighed 15 cwt., several were 20, and a few 21 cwt. No ballast was used ; and no dunnage, but the casks were well quoined and well chocked in the quarters so as to keep the bilge free and throw the whole weight of every cask on its quarter hoops, whether above or below. Four heights were in the hold and two in the 'tween decks. The casks were stowed empty and filled with a hose ; bung-holes and spile-holes, free, or the casks would fly through fermentation. Her draught when laden was 18 feet 4 inches aft and 16 feet 4 inches forward, the same as with a dead-weight cargo of railway iron and coal.

On discharging at Liverpool, in November, the draught was—aft 17½ feet, forward 15. The diminished draught arose chiefly through the loss of molasses on the passage, being as much as 75 out of 500 tons ; it occurred chiefly in the 'tween decks, where, by the rolling of the ship, the bung-holes of the hogsheads were turned downward ; as usual they were stowed fore and aft, and the master suggests that such casks (or even all the cargo there) should be stowed *a-burton*, by which, when the ship rolls, they would come end on against each other, and would thus support each other, and

involve much less risk of their turning. In the hold, the casks being stowed in the "round" of the ship, her working at sea only tended to tighten them where they were stowed; but the upper tier here not being so tight, it might be prudent to stow that tier *a-burton*, also. Part of the loss arose from imperfect casks. The average loss from Cardenas is nine ¢ cent.; it has been as little as six ¢ cent. Five heights of casks have been stowed at Cardenas; wood is dear; native stevedores are employed. Fourteen days were occupied in loading and about three weeks in discharging: the casks partly empty had to be filled from the others, before weighing. The season for shipment at Cuba is principally in August and September, after the sugar season; small quantities are shipped in the spring. This barque discharged general cargo from Marseilles at Havannah, (Cuba) and then loaded molasses at Cardenas. The lighterage there is 37½ cents per hogshead in the inner roads and a dollar in the outer roads. Her tonnage, 430 tons, was taken by the Spanish laws as 526 tons, and the port charges for discharging were \$2 30 cents ¢ ton. Pilotage, in \$20, out \$10. The lights in addition. For loading at Cardenas the charges are 5 cents ¢ ton; pilotage heavy. If a ship takes coal to Cuba, the port charges are 25. ¢ ton.

PORT CHARGES AT CUBA.

HAVANNAH.		¢	c.
Pilotage and interpreter	22	0	
Wharf, pilotage to \$10; from \$5	15	0	
Steam-towage to wharf	13	50	
Pilotage out to sea	10	0	
Tonnage dues on 336 tons, at \$2 30c.	841	80	
160 tons curtailed, \$2 30c.	368	0	
Pass \$2 12c.; Annotation \$2 13c.; Dispatch \$4 25c. ...	8	50	
Stamped paper \$1 25c.; Officio \$6 38c.	7	63	
Measurement \$6 37c.; tonnage certificates \$4 25c.	10	62	
Consul's fees—commission at 2½	4	25	

CARDENAS.

Entry and stamps \$1; Pilotage in and out \$82	83	0
Permit for discharging ballast \$5; Interpreter \$4 ...	9	0
Consul's fees \$4 25c.; Hospital \$100; Stevedore \$160	264	25
Tonnage dues on 430 tons, at 5c.	21	50
Lighterage, 430 hhds., 37½c.	161	35
Ditto, 395 hhds., at \$1	395	0

742. **Leakage.** *Elizabeth Baring v. TWIZELL*, Queen's Bench, 14th May, 1853; in this case it was decided that leakage of casks of molasses, weather being such as might be reasonably expected on a voyage from the West Indies; shipowner held liable. It is not enough to show that the cargo was properly stowed; the burden rests with him to prove that damage was caused by the perils

of the sea. In the Bristol County Court, January, 1867, Mr. HANCOCK brought an action against the steamer *Pioneer*, for the value of two puncheons (out of five) shipped perfect in London, but delivered with their heads out at Falmouth. A notice, limiting the liability, having been previously served on the shipper, molasses well stowed, and heavy weather experienced, judgment was given for the ship with costs.

Tonnage. Bengal and Madras ton 20 cwt. ; in Australia 20 cwt. At Bahia, 181 old gallons in pipes. A hogshead of Havannah 110 gallons ; a coboy at Cuba 110 gallons.

743. MONSOONS have a very important effect on the produce of the *land*, and in some measure govern the harvest ; a knowledge of them is therefore very necessary to masters and shippers in order to select the season suitable for the arrival of a ship at certain ports of loading. Moonsoons are periodical winds which blow half the year from one quarter and the other half in an opposite direction. They are most steady in the East Indian Seas, especially north of the Equator, from the coast of Africa to the eastern side of the Bay of Bengal ; also in the China Seas, but less regularly in the northern part. The *South-west* monsoon (rainy) April to October, between the Equator and the tropic of Cancer, reaches from the east coast of Africa to the coasts of India, China, and the Philippine Islands ; its influence extends sometimes to about longitude 154° E., and it reaches as far north as the Japan Islands. The *North-east* monsoon is *dry*, as the wind comes from the land ; it prevails from October to April, and extends over nearly the same space as the south-west monsoon. A *North-west* monsoon accompanied by *rain*, prevails from October to April and a *South-east* monsoon (dry) from April to October, between the north-east coast of Madagascar and the north-west coast of New Holland, including also Torres Straits. They are generally confined between the Equator and latitude 10 or 11° S., but are subject to irregularities. A south-west monsoon prevails from April to October in the Mozambique Channel. Monsoons blow periodically towards that hemisphere in which the sun is found, and has had time to warm the land *above* the temperature of the adjacent sea. Hurricanes usually occur in both hemispheres about a month after the sun has returned from the tropics about five degrees towards the Equator. In Bombay the fair season commences usually on 1st October, and closes 31st May ; the monsoon begins 1st June, and ends 30th September.

744. **Trade Winds** blow regularly (with occasional modification) within or near the tropics, especially in the open parts of the Pacific and Atlantic. The chief region is between latitude $23\frac{1}{2}^{\circ}$ N. and $23\frac{1}{2}^{\circ}$ S. ; in some parts they extend to 28° N. and S., while at others,

well within the tropics, and even close to the line, totally different winds prevail. North of the line the trades are north-east; south of it they are called south-east, but neither blows direct from the quarter indicated—they blow more or less from the eastern towards the western parts of the compass. The southern margin of the north-east trades ranges between 5° and 6° north latitude, but from December to May inclusive, it frequently reaches to 3° N.; from June to November it seldom extends as far as 8° , and is usually at 14° . The northern limit of the S.E. trades is from January to May, 1° or 2° N. latitude; in summer and autumn it is a degree or two still further north. At the equatorial limits of both trades they blow easterly. At their tropical limits the trades blow N.E. or S.E. respectively.

745. MOTHER O'PEARL shells, drops, &c. Bengal and Madras ton, bags or chests 20 cwt.; Bombay, bags 20 cwt., cases, 50 cubic feet.

746. MUNGO is the term adopted for woollen remnants and old rags; judiciously used, it is said the material may often be a real advantage as regards the touch and appearance of the cloth made from it, but in excess it produces poorness of texture. Shoddy was first brought into use about 1813 at Batley, near Dewsbury. Mungo was adopted in the same district, but at a later period. Shoddy is the produce of soft woollen rags, such as old worn out carpets, flannels, guernseys, stockings, and similar fabrics. Mungo is the produce of worn-out broad or similar cloths of fine quality, and of the shreds and clippings of cloth. The origin of the word "mungo" is said to be as follows; a manufacturer gave some of the materials to his foreman, who, after trial in the shoddy machines, came back with the remark, "It winna go;" when the master exclaimed, "But it mun go." These old woollen rags are collected and imported from India, China, Egypt, Turkey, Russia, and, in fact, all parts of the world where woollen garments are worn. They come to Yorkshire from districts where plague, fever, smallpox, and loathsome skin diseases extensively prevail; they are sorted by human fingers when the bales are opened before being placed in machines which tear up, separate, and cleanse the fibre for manufacture; but the Rivers' Commission mention that 50 years' experience has proved that these rags are not in any degree dangerous to the health of those who work among them, although in many of the countries where they are collected, they are believed to be peculiarly plague-bearing materials. The lapse of time in collecting, sorting, and transmitting the rags, and the possible destruction of any special poison by friction or otherwise, must be taken into account. Mixed with wool, shoddy

or mungo is largely used in the manufacture of cheap broadcloths, finer cloths for ladies' capes and mantles, pilots, witneys, friezes, petershams, pea jackets, blankets, &c. Felted cloth is extensively manufactured with it, and used for table-covers, carpets, druggets, and horse-cloths. In the docks at Hull, mungo, being hazardous, is only housed in a place by itself; the rent is charged by agreement.

747. MUNJEET, a species of *rubia tinctorum* or madder, produced in Nepaul and various districts in India. It is so bulky that brokers estimate £4 $\frac{1}{2}$ ton freight, as equal to 115. 1d. $\frac{1}{2}$ cwt. on the value of the article. It is mostly in small packets of 600 or 800 to a ton, sometimes it is packed in bales like cotton. Bengal and Madras ton, cases or bales 50 cubic feet; Bombay ditto, and bundles or bags 12 cwt.

748. MUSICAL INSTRUMENTS require a very dry berth, and for the cases to be kept the right way up.

749. MUSK is obtained from a small bag under the belly of a species of deer inhabiting the great Alpine mountain range which belts the north of India, and branches out into Siberia, Thibet and China. The musk from Boutan, Tonquin, and Thibet, is most esteemed; an inferior sort comes from Bengal, and a still baser sort from Russia. A single musk pod usually contains from two to three drachms of grain musk. It is imported from China in caddies, lined with sheet lead and paper, and containing from 50 to 100 oz. each. It is often adulterated with the animal's blood, with dark friable earth, and with lead. As the odour is very penetrating, it should be kept apart from goods liable to become tainted with it. The endurance of this odour is marvellous; when JUSTINIAN, in 538, rebuilt what is now the mosque of St. Sophia, the mortar was charged with musk, and it is said, that the atmosphere is filled with the odour at the present time. The late Honourable East India Company ordered that no musk be brought in the same ship with tea. **Tonnage.** 20 cwt. go to a ton; Bombay 50 cubic feet. A box containing a pecul of Chinese musk measures 8 cubic feet; 6 $\frac{1}{2}$ go to a ton.

750. MUSTARD is manufactured chiefly in Leeds, Liverpool, and London; its weight is equal to that of wheaten flour, and it is shipped during all parts of the year. It is made up in kegs, also in tins and bottles, which are packed in hogsheads; the weights therefore vary from 28 lbs. to two or three cwt. Manufacturers prefer for stowage the coolest, most airy, and driest part of the hold; and the

pressure of heavy goods must be avoided. Mustard should be placed at a distance from tar, petroleum, naptha, essential oils, and aromatic drugs. The tares in bottles and small tins are about one-half.

751. **NAPTHA** ; there are two sorts, wood naptha or pyroxilic spirit, and coal naptha or benzole ; specific gravity 0·700 to 0·847. It ought not to be stowed near tea, &c. ; some masters refuse naptha unless in iron casks ; the Liverpool underwriters, 16th April, 1858, recommend it to be stowed on deck and packed in small iron tanks, or very strong wooden casks, weighing not more than two cwt., so as to be easily handled on an emergency. In case of breakage or leakage, avoid taking a lighted candle near, for naptha is not only inflammable of itself, but its vapour is highly volatile and combustible. Naptha and turpentine burn more fiercely by the application of moderate quantities of water. Where it is possible to apply them, wet blankets, or wet sails or sail cloth, may possibly stifle the fire, if applied closely ; see dangerous goods.

752. **Conflagration.** On Christmas day, 1857, the ship *New England* left New York for Glasgow. A fierce storm came on and caused the sea to sweep over and partially fill the vessel. The crew were ordered to the pumps, and in the midst of hail and rain, they day after day stood up to their waists in water, and almost perished with cold. Notwithstanding their efforts the water gained ground and she began to sink. The master, A. PENDER, directed certain portions of the cargo to be thrown overboard, with a view of keeping her afloat a little longer. During the lightening of the ship, by some circumstance or other, a large quantity of naptha ignited, and after causing a fearful explosion, ran in liquid flames over the deck, making dreadful havoc among the seamen. One person (TAYLOR) was standing on a part of the vessel under which the naptha was stowed, and when the explosion occurred he was completely enveloped in flames ; five others, including the first officer, were dreadfully burnt ; and in addition to the burning, one boy had his thigh broken. The men who escaped more serious injuries had their faces scorched and blackened. When matters were fast approaching a crisis, the barque *Cora Linn*, Capt. J. GONDEY, came sufficiently near to rescue the whole. The man most burnt died on board ; the others were sent to the hospital at Liverpool, 24th January. The first officer was standing by the galley door, and within four or five feet of TAYLOR when the explosion took place. His clothes took fire ; he got off as soon as possible, and had the presence of mind to tear off his clothes in part, and, with the parts torn asunder, to smother the fire ; he escaped in his drawers without burns.

753. NETHERLANDS. The principal ports are Amsterdam—entrance Nieuwe Diep or Texel; Rotterdam; Schiedam; Dordrecht—entrance for steamers and coasters, Brielle or Helvoetsluys, and for ships drawing more than 16 feet Brouwershaven. When ships draw too much water to go through the Maas, entrance at Helvoetsluys Brielle, they can go to Brouwershaven where there is always sufficient depth; lighters are constantly ready to reduce a ship's draught to 18½ or 19 feet English. Holland trades chiefly with Java, Australia, North America, and South America. The exports to Java are cotton goods and provisions; to North America gin, madder, flax, and German wines; to Australia gin in cases, measuring from two to three feet and containing four gallons; and to South America, gin, sugar in casks of six feet, and sundries. As there are more imports than exports, sand ballast is often required; masters should be careful not to engage with those who have insufficient means to complete their contract, as when westerly winds prevail, ships have to wait more than a week before they can get sand, and then it is so wet that it contains 15 ¢ cent. of water. Good ballast is usually obtainable from a steam dredger which is stationed near Rotterdam, where there are always licensed lighters at hand. Trade is carried on almost exclusively by a measure called a Last, nine of which make 17 Netherland tons. Two tables Nos. one and two, inserted page 439, show the proportion which the last bears to the ton and the ton to the last. Table No. three contains the Indian scale of Tonnage per last delivered. Table No. four gives the rates of Tonnage in the East. In measuring ships 429 Netherland tons are equal to 400 English. Under the heading Tonnage there are tables showing the proportion of the tonnage of the ships of the two nations.

754. With reference to loading in Java, an English master says—"When engaging for mixed cargoes from Batavia, Cheribon, and Tagal, (all on the north coast of Java,) that is, tin, arrack, sugar, pepper, india-rubber, gum, benzine, cassia-vera, (low quality of cinnamon), and dry hides, masters should charter by the last, as shown in table three, and not by the ton, as there is then no tare. Pigs or blocks of tin, which are about ¼ cwt. each, or ¼ picol = 31 kilos, should be placed on the floor athwartships, about six inches apart, so as to leave a water-course. Care should be taken in stowing the arrack; the beds are found by the merchant, to be delivered on discharge of the cargo in Holland. The master is expected to take a quantity of sapan wood as dunnage, the cost of which is paid by the ship; it should not be put between the ends of the casks, for on the passage (being very hard) it may work through the heads, and the

loss by leakage would fall on the ship. Stow pepper in the ends, india-rubber where convenient, amongst the sugar. Sugars in baskets are sometimes packed very loosely in Batavia, and are difficult to stow advantageously as one end is round and the other square; they contain from 5 to 6 cwt. Cheribon and Tagal baskets are packed closer, and are so far better for stowage; some are six or eight inches longer than others; considerable judgment is required when stowing. Nothing should be placed on cassia, which is rolled up in loose mats."

755. An intelligent Dutch stevedore (who has had great experience in the Java trade) observes that a Java cargo should be very carefully dunnaged; generally block tin is used as described above, then rattan or sapan wood, and cajang (katjang) mats over all the sides of the hold. The bulk of the tin below: the remainder should be kept to trim the ship, and decrease the chance of rolling at sea. Hides (dry) should be floored over a flat tier of sugar, filling up with coffee or rice; never stow hides under sugar. Ventilate as much as possible during the voyage. In handling tobacco avoid the use of hooks and do not press heavily. Arrack takes about 120 English feet per last, or three casks, called in Dutch, leggers. A last in Java is computed at 2'84 cubic metres,* government measure, or 100 English cubic feet; long experience only can give an idea how to load ships there profitably, as although the lastage is the same, the exports and the packages vary at the different ports. When chartering always insert the number of discharging days in Holland. For discharging 250 measured lasts of Java cargo, 60 working days are allowed, and one day more for every additional last, according to the Netherlands Trading Society. When no discharging days are stipulated for by charter-party or bill of lading, the Dutch law allows 15 working days for unloading. The ship pays all the cost of weighing and measuring cargo. When coffee is very light, the lastage is determined by placing twelve bushels of average coffee in three bags and weighing them; their weight determines the last; this is only done when chartered with government coffee.

1,000 kilos = 1 cubic metre of water;
1 English ton = 1,015 kilos.

* 2'84 cubic metres is the standard, but excepting tobacco, the measurement of a Java cargo is said to be against the ship on this standard; on an average a Dutch last measures more than 100 cubic feet English.

NETHERLANDS—JAVA CHARTER-PARTY.

LONDON, 14th February; HAMBURG, 17th, 1865. **It is this day mutually agreed** between owner, of the good British vessel called the 375 tons register, 5-6 1-1 Veritas guaranteed for the time of the voyage and yellow metalled, now lying at and Messrs. of Hamburg, merchants. That the said ship being tight, staunch, and strong, and every way fitted for the voyage shall, after performance of her intended voyage from Schiedam for the Amoor, proceed to Batavia, and receive orders there within 24 hours after arrival, for loading from one or two safe Java ports, or from Padang, and be delivered without delay to the sole use and free disposal of the freighters (the cabin and the proper place for stowing the sails, water, cables, and provisions, as also the necessary room for the crew excepted, and the captain not being permitted to load any goods for whomsoever without the consent of freighters or their agents) to receive on board in port or ports as ordered, a full and complete cargo of East India produce or other lawful merchandize, excluding wood, which the said merchants bind themselves to ship, not exceeding what she can reasonably stow and carry over her tackle, apparel, provisions, and furniture, and being so loaded shall therewith proceed without delay to Falmouth or Cork for orders to discharge at a safe port of the United Kingdom, or on the Continent between Havre and Gottenburg, both inclusive, or so near thereunto as she may safely get, and deliver the same on being paid freight at the rate of 75s. British sterling if loaded in Java as above, or 80s. if loaded at Padang in full per ton net weight delivered, according to East India Co.'s rate of tonnage. Ship to lay always afloat. Dunnage consisting of rattans, sapan wood (and or) canes, as much as the ship requires, to be furnished by charterers, and delivered free of freight. Port charges and pilotage as customary for account of the ship.

(The Act of GOD, restraint of princes and rulers, &c., the usual clause.)

Freight to become due and be paid on unloading and delivery of cargo at the port of discharge, in cash at the current rate of exchange. Master to sign bills of lading at any current rate of freight as may be required by the agents of charterers, without prejudice to this charter-party, and ship to have an absolute lien upon the cargo for all freight, dead-freight, and demurrage. Cargo to be sent alongside and taken from alongside at expense and risk of charterers, who may direct the ship to the most convenient anchorage.

Thirty-five running days, Sundays excepted, are to be allowed the said merchants (if the ship be not sooner dispatched) for loading in the East Indies and waiting for orders at the port of call, such days to commence the day after the vessel being in a proper loading berth, and having a clear hold; notice thereof to be given by the master in writing. Time occupied in shifting ports not to count as lay days. Unloading the vessel in Europe to be effected with customary dispatch, and according to uses and customs of port of discharge.

Demurrage over and above said laying days, at ten pounds British sterling per day, payable day by day as it becomes due. The captain is bound to have the certificate of Veritas' classification on board of his vessel, and is bound to produce it if required by the charterers. Cash for ordinary ship disbursements, average cases excepted, and not exceeding three hundred pounds, to be advanced at respective ports of loading by the charterers on account of freight, subject to usual premium of insurance and commission.

As liquidated damages in case of non-performance of this agreement two thousand pounds B.S. must be paid by the party delinquent to the party observant.

The vessel to be consigned to charterer's agents abroad and in Europe, paying only one commission of two ½ cent. of the freight.

Lay-days not to commence before 30th June, 1865; should the vessel not have arrived at Java by 31st December, charterers to have option of cancelling this charter-party.

In witness thereof copies of the same tenor and date have been attested, one of which being accomplished, the others to stand void. Should the said ship have to change ports as above, charterers shall provide sufficient dead-weight as ballast; not more than 50 tons of arrack (and or) loose paddy to be shipped: rattans, sapan wood (and or) canes to be shipped only as dunnage. The captain has to apply in Batavia to Messrs.

Witness to the signature of Messrs.

Signed

Signed

Signed

No. 1. NETHERLANDS TABLE for turning LASTS INTO TONS.

last.	ton.	last.	ton.	last.	ton.	last.	ton.
1	1·9	28	52·9	55	104·	82	155·
2	3·8	29	54·8	56	105·8	83	156·9
3	5·7	30	56·7	57	107·7	84	158·8
4	7·6	31	58·6	58	109·6	85	160·7
5	9·5	32	60·5	59	111·5	86	162·5
6	11·3	33	62·4	60	113·4	87	164·4
7	13·2	34	64·3	61	115·3	88	166·3
8	15·1	35	66·2	62	117·2	89	168·2
9	17·	36	68·	63	119·1	90	170·1
10	18·9	37	69·9	64	121·	91	172·
11	20·8	38	71·8	65	122·9	92	173·9
12	22·7	39	73·7	66	124·7	93	175·8
13	24·6	40	75·6	67	126·6	94	177·7
14	26·5	41	77·5	68	128·5	95	179·6
15	28·4	42	79·4	69	130·4	96	181·4
16	30·3	43	81·3	70	132·3	97	183·3
17	32·1	44	83·2	71	134·2	98	185·2
18	34·	45	85·1	72	136·1	99	187·1
19	35·9	46	86·9	73	138·	100	189·
20	37·8	47	88·8	74	139·9	200	378·
21	39·7	48	90·7	75	141·8	300	567·
22	41·6	49	92·6	76	143·6	400	756·
23	43·5	50	94·5	77	145·5	500	945·
24	45·4	51	96·4	78	147·4	600	1134·
25	47·3	52	98·3	79	149·3	700	1323·
26	49·1	53	100·2	80	151·2	800	1512·
27	51·	54	102·1	81	153·1	1000	1890·

No. 2. NETHERLANDS TABLE for turning TONS INTO LASTS.

ton.	last.	ton.	last.	ton.	last.	ton.	last.
1	0·5	30	15·9	59	31·1	88	46·5
2	1·1	31	16·4	60	31·7	89	47·1
3	1·6	32	16·9	61	32·2	90	47·6
4	2·1	33	17·4	62	32·7	91	48·1
5	2·6	34	18·	63	33·2	92	48·6
6	3·2	35	18·5	64	33·8	93	49·2
7	3·7	36	19·	65	34·3	94	49·7
8	4·2	37	19·6	66	34·8	95	50·2
9	4·8	38	20·1	67	35·4	96	50·7
10	5·3	39	20·6	68	35·9	97	51·3
11	5·8	40	21·1	69	36·4	98	51·8
12	6·3	41	21·7	70	37·	99	52·3
13	6·9	42	22·2	71	37·5	100	52·9
14	7·4	43	22·7	72	38·	200	105·7
15	7·9	44	23·3	73	38·6	300	158·6
16	8·5	45	23·8	74	39·1	400	211·5
17	9·	46	24·3	75	39·6	500	264·3
18	9·5	47	24·8	76	40·2	600	317·2
19	10·	48	25·4	77	40·7	700	370·1
20	10·6	49	25·9	78	41·2	800	422·9
21	11·1	50	26·4	79	41·7	900	475·8
22	11·6	51	26·9	80	42·3	1000	528·7
23	12·2	52	27·5	81	42·8	1100	581·6
24	12·7	53	28·	82	43·3	1200	634·5
25	13·2	54	28·5	83	43·8	1300	687·4
26	13·7	55	29·	84	44·4	1400	740·3
27	14·3	56	29·6	85	44·9	1500	793·2
28	14·8	57	30·1	86	45·5	1700	899·
29	15·3	58	30·6	87	46·	1900	1004·8

No. 3. SCALE IN LASTAGE OF DUTCH EAST INDIA Co.

According to Last delivered as below.

Arak, <i>Arrack</i>	leggers	3	Koffij (vaten) in casks ...	Ned. lb.	1,550
Cassia Vera	Ned. lb.	950	Id. Leg (halen) <i>superior</i> ..	-	1,600
- Lignea	-	950	Nagelen, <i>Cloves</i>	-	1,000
Cochinille, <i>Cochineal</i> ...	-	1,500	Koffijveegsel, <i>Coffee</i>		
Ebbenhout, <i>Ebony</i>	-	2,000	sweepings ..	-	2,000
Foelie, <i>Tin foil</i>	-	1,200	Noten (gave), <i>Nutmegs</i> ...	-	1,500
Gom-Benzoin, <i>Gum</i> ...	-	1,750	Id. (geinfect). <i>unsound</i> ..	-	1,350
Gom Damar, <i>Gum</i>	-	1,550	Notenzeep, <i>Nutmeg soap</i> ..	-	1,500
Gom Elastick, <i>Gum</i>	-	1,400	Parelmoer, <i>Mothero' pearl</i>	-	2,000
Gom-Copal, <i>Gum</i>	-	1,500	Peper in balen, <i>Pepper</i>		
Goudzand, <i>Gold dust</i> ...	-	2,000	in bales	-	1,500
Gutta Percha	-	1,400	Rijst, <i>Rice</i>	-	2,000
Hennep, <i>Hemp</i>	-	900	Sago	-	1,500
Huiden los*, <i>Hides loose</i>	-	1,200	Schildpad, <i>Tortoise shell</i>	-	1,000
Indigo	-	1,300	Suiker kanassers of kran-		
Kamfer (in enkele of			jangs, <i>Sugar in Baskets</i>	-	2,000
dubb. fust), <i>Camphor in</i>			Tabak, <i>Tobacco</i>	-	800
single or double packages	-	1,100	Thee (Java), <i>Tea</i>	-	930
Kaneel, <i>Cinnamon</i>	-	950	Tin	-	2,000
Kopper, <i>Copper</i>	-	2,000	Vlas, <i>Flax</i>	-	900
Kurkema, <i>Turmeric</i> ...	-	1,500	Was, <i>Wax</i>	-	2,000
Koffij (balen) <i>Coffee, bales</i>	-	1,800	Wol, <i>Wool</i>	-	650

* Huiden (in pakken) later te regelen, *Hides in packages, as per agreement.***No. 4. SCALE OF TONNAGE OF DUTCH EAST INDIA Co.**

The weights are net weight delivered.

Arrac*	old gals.	252	Indigo	cub. feet	50
Camphor	cwt.	15	Mace	cwt.	8
Canes, Malacca	-	6,000	Mother o' Pearl	-	20
Cassia Fistula	cwt.	10	Nutmegs	-	15
- Lignea	-	8	Paddy, loose	-	20
- Vera	-	8	Pepper, black	-	16
Cinnamon	-	8	- white	-	18
Cloves	-	12	- long	-	12
Cochineal	-	20	Rattans	-	20
Coffee	-	18	Rice	-	20
Copper	-	20	Sago flour	-	20
Cubets	-	16	- pearl	-	20
Cutch	-	20	- brown	-	16
Drugs, not rated... ..	-	16	Sugar	-	20
Dyewoods	-	20	Tamarinds	-	20
Ebony	-	20	Tortoise Shells	-	20
Gambier	-	20	Tin	-	20
Gum Benjamin	-	20	Tobacco	-	15
- Damar	-	20	Turmeric	-	16
Gutta Percha, loose ...	-	20	Goods not enumerated...	cub. feet	50
Hides, dried	-	16			
Horns	-	20			
India Rubber	-	20			

If heavy at the before mentioned rate according to species.

The imperial gallon = 4.54 litres; 1 litre = '0001 cubic metre; 1 cubic metre = 35.3 English feet.

756. **NEW ORLEANS.** At New Orleans, according to existing (1867) regulations of the Chamber of Commerce, when vessels are chartered or goods shipped by the ton, and no special agreement respecting the proportion of tonnage which each particular article shall be computed at, the following regulations are the standard. That the articles to equal a ton of heavy materials shall in weight be as follows :—

1,568	lb.	Coffee	casks
1,830	—	—	bags
1,120	—	Cocoa	casks
1,300	—	—	bags
950	—	Pimento	casks
1,100	—	—	bags
8	barrels	Flour, of 196 lb. each	
6	—	Beef, pork, tallow, pickled fish, and naval stores	
2,240	lb.	Pig and bar iron, lead, and other metals or ore,	
		heavy dye-woods, sugar, rice, honey, or other	
		heavy articles, gross	
672	—	Ship bread	casks
784	—	—	bags
896	—	—	bulk
200	gallons	Wines, brandy, spirits, and liquids generally,	
		reckoning the full capacity of the casks, wine	
		measure	
22	bushels	Grain, peas, and beans	casks
36	—	—	bulk
36	—	Salt—European	
31	—	— West Indian	
28	—	Stone coal	
40	cubic feet.	Timber, planks, furs, peltries in bales or boxes,	
		cotton, wool, or other measurement goods	
1,120	lb.	Dry hides	
56	—	Corn	7/8 bushel
60	—	— by freight	7/8 bushel

757. **NITRE** or Nitrate of Soda is imported in large quantities from **Iquique**, a small port on the coast of Peru. Being very deliquescent and quickly soluble in water, it requires good dunnage, and to be stowed in a dry position, apart from brimstone, and under sugar, from which it should be well dunnaged. There is always a per centage allowed for shrinking, but if the nitre comes on board in a very green state, this per centage is scarcely sufficient; specific gravity 1'900. At Valparaiso a quintal is 100 lbs.; some say it is a little over 101 lbs.; see saltpetre, in which article there are full details of nitre, &c.

758. **NITRO-GLYCERINE.** In May, 1868, it was determined by the authorities of the London and the St. Katherine Docks not to receive nitro-glycerine under any circumstances; see oils.

759. NITROS ACID. On 8th September, 1865, some alarm was created in the city, by a report of a serious fire having broken out at the extensive chemical warehouses of Messrs. DREW, BARRON, & Co., Bush Lane, Cannon street West. For a time the whole of the upper part of the building was clouded in smoke, which was pouring out of the windows. To all appearance the place was on fire, but on arrival of the fire brigade it was ascertained to arise from a case of nitros acid, which had exploded from the heat of the weather (therm. 114° in the sun). Owing to the suffocating character of the vapour, the fireman could not enter the floor where the case was; but an engineer in a smoke jacket, got at the case and turned it into the street, when all alarm ceased. No damage was done to the premises.

760. NUTMEGS are packed at Singapore in boxes and casks of various sizes; the produce in the Moluccas has been reckoned at from 600,000 to 700,000 lbs. per annum, of which half goes to Europe; and of mace 150,000 lbs. 15 cwt. go to a ton; Bengal, Madras, and Bombay ton 50 cubic feet in cases, chests, or casks; a cask contains 200 lbs.

761. NUTS require to be well dunnaged, kept dry and not put in the same hold with bone dust, guano, &c. Madras ton 12 cwt. nuts ground, in shell, 16 cwt. shelled. A bag at Messina contains from $1\frac{1}{4}$ to $1\frac{3}{4}$ cwt.; at Barcelona 1 cwt. 16 lbs., of which 14 go to a ton; see fruit.

762. **African** The brigantine *Token*, Capt. Bisson, belonging to Messrs. DESLANDES, of Jersey, shipped at Lagos in May and June, 1864, a cargo of palm kernels for London; they were gathered ripe in the previous March and April, and weighed about 32 lbs. \varnothing bushel. The *Token* registers 107 tons, is 76'2 feet long, 16'8 broad, and 10'6 deep. With 145 tons general cargo from London, discharged at Cape Palmas and Lagos, she drew 10 feet 6 inches; with the kernels 139 tons, which filled the hold, 10 feet 2 inches aft, and 9 feet 10 forward. The hold was matted all over as if for a cargo of grain. She left Lagos 12th June; the cargo became heated immediately; the mate fell sick on the 13th and died on the 27th; three sick men were landed at Falmouth, 7th September; two died there. Their sickness was caused by the nauseous effluvia from the nuts; it commenced with giddiness and head-ache, and was followed by extreme pains in the chest, and swelling, and in one case by diarrhoea. With a head wind those in the fore-castle were most effected; with the wind aft those in the cabin. The *Token's* port charges at Cape Palmas were \$16 50c.; no pilotage.

763. The brig *Volunteer*, 207 tons register, Capt. RICHARD WILLIAMS, belonging to Caernarvon, which is 98 feet long, 22 broad, and 13 deep, loaded palm kernels at **Lagos** in the year 1864: no ballast was required; dunnage consisted of African wood in the bottom 10 inches; bilges 14; double mats were placed over all. With 327 tons weight of kernels she drew 12½ feet aft and 11 forward; by her draught the weight of the kernels was estimated. With 339 tons of railway iron she drew 12 feet 8 inches aft and 11 feet 10 forward. Her best trim is 12½ feet aft and 11 feet 2 forward. She was loaded outside Lagos bar (2½ to 2¾ fathoms) from boats, and the surf was sometimes so severe that they could not come over it for a fortnight. She took 55 days loading; lay-days 45; £4 ½ day demurrage. To keep the vessel in trim a temporary bulkhead was carried across aft within 5 feet of the stern-post, and another about two feet before the foremast. Finding, on the voyage, that she was too much by the stern, a portion of the cargo was packed in bags and placed forward. While loading two of the crew were sick, probably from the great heat of the nuts—one had the coast fever, and the other was attacked with epileptic fits. She sailed 20th August, and arrived at Plymouth 21st November—94 days; her cabin and forecastle are on deck, and there was no sickness during the voyage, but in consequence of the heat no one could remain more than a quarter of an hour in the fore compartment, where spare rope, empty water casks, &c., were deposited. At Lagos there are no **port charges**; **pilotage** over the bar, up the river, if required by the *Volunteer* £10.

764. The brig *Magician*, Capt. EDWARD JAMES HAMON, belonging to Messrs. STEPHENSON & JACKSON, of London, loaded nuts at the **Sherbro Islands**, in June and July, 1866. They were called palm nut kernels, are the produce of the palm tree, and were brought from the interior in traders manned by slaves, under a native chief who exchanged them (and palm oil) at the factories for sugar, cloth, guns, rum, tobacco, &c. The kroomen (brought from the Banana Islands,) who assisted in loading, received 1s. and a quart of rice daily. The *Magician* was about five weeks loading as she had to go to several islands; she had a Sierra Leone pilot, who took charge off the lighthouse there; his pay was 5s. ½ foot for piloting in; the same out; with 20s. for every removal. He lived in the cabin and received on discharge 10s. to pay his passage to Sierra Leone; the kroomen had each 3s. for conveyance from the Bananas. The **season of shipment** for nuts is all the year round, but chiefly from June to September inclusive; they weigh when loading about 56 lbs.

♯ bushel, and on discharge in Great Britain it is said 37 to 40 lbs. The *Magician* registers 210 tons new measurement, and 216 old, and carries 320 tons of cargo; she is about 101 feet long, 21 broad, and 16½ feet deep. Being very crank she required 25 tons of ballast, dry stone and iron, which was covered with thick African matting. Sherbro mats are very large, and very good; cost 3s. each. She received 267 tons of nuts and then drew 15½ feet, the same as with a dead-weight cargo. These nuts are considered heavy, but a vessel can be loaded chock a block with them, probably because their weight is always decreasing while on board. The *Magician* left the coast 24th July, and arrived at Falmouth 2nd October. She was bound to Harburg near Hamburg, where the freight would be paid by weight delivered. The steaming from the nuts decreased 80 ♯ cent. on reaching the colder latitudes. Her crew consisted of nine men all told, of whom eight were laid up with the coast fever at Sherbro. On the passage two died; three others were sick, so that the navigation was left to four, of whom the mate, Mr. R. DUFFEL, was the only one who retained his health throughout. Her accommodations were below, and the men were compelled to sleep on deck under awnings. Vessels engaged in the trade should have deck-cabins and deck-houses. The *Magician* took in general cargo from London to Sierra Leone, where her **port charges**, with cargo inward and ballast out, were £70 to £75. **Pilotage** in 5s. ♯ foot; out 2s. 6d.; each removal in the harbour 20s.

765. Capt. HAMON recommends that at Sherbro the crew of a vessel should not be exposed to the heat of the sun, to rain or to the night air. Quinine administered twice daily is considered beneficial. Light food is to be preferred; poultry, fish, and cassado roots, are cheap. The ship's spirits should be used with moderation; that from the shore must be avoided altogether as it brings on the country sickness, which is also greatly increased by the bad quality of the water at the islands, especially in the summer time when there are no rains. Bendoo Island, being more lofty than its neighbours, produces somewhat better water. Sufficient stock ought to be taken at Sierra Leone or elsewhere, to last at Sherbro. After departure, the tanks and casks can be replenished from the upper well in the Bahamas, where it is almost necessary for vessels to anchor to discharge their pilots and kroomen. At Sherbro, according to Capt. HAMON, the early symptoms of sickness are generally headache and pains in the back, followed by vomiting and purging. It is usual first to administer an emetic, and to shave the head and keep it cool with a wet cloth. A mustard poultice is then applied to

the back of the neck and another on the bowels if there is any pain in the chest. The last remedy is calomel. Medical aid is very expensive; a surgeon charges £5 for visiting a vessel, besides the cost of a boat. Bendoo, is four miles, Yalabama or York Island eight miles, and Bouth five from the military barracks at Victoria, (on Sherbro Island) where the surgeon is stationed. The account against the brigantine *Belle*, in 1866, was £180; nearly all the crew died, including the master and mate. She was navigated by a pilot and kroomen to Sierra Leone, where a new master joined and took her to Liverpool. Masters engaged to load nuts at the Sherbro Islands should have a previous knowledge of the navigation, or they ought not to attempt to enter without a pilot. Of the two entrances to Sherbro, the safer one is to the north, at the beginning of the Plantain Islands. At the Sherbro Islands banks of sand prevail everywhere. Bouth is a convenient place for loading; there are two factories; one of which belongs to Mr. HEDDLE, of Sierra Leone; the water is 13 feet deep alongside the wharf, and vessels are soon dispatched. The other is the Hanover factory, with 12 feet alongside at low tide, owned by Messrs. LOWENTHALL BROTHERS. Yebana is a considerable place for loading, and an ordinary vessel can discharge ballast and get in her cargo there in three days. At York Island there are two factories; one belongs to Mr. FISHER, a resident of 35 years; vessels lie 50 yards from the shore, and are loaded from canoes each carrying 10 to 15 tons. At Bendoo vessels lie a mile and a half from the factory, and are loaded from canoes at the rate of 30 or 40 tons per day. There are no **port charges** at Sherbro Islands; the cost of pilotage is stated previously. The outer anchorage of Sierra Leone is dangerous in consequence of the swells which prevail when there are breezes from the S.W. The Banana Islands are say 15 miles from Sierra Leone, the Plantains 15 from the Bananas, and York Island 40 from the Plantains. It is usual to calculate the navigation from Sierra Leone to York island at eighty miles. Eight miles from York Island, is Victoria, the Government station; it is on the northern side of the Shebar River, which forms the southern entrance to the Sherbro Islands; at its entrance is a bar on which a heavy surf is running almost constantly. Under the heading palm oil there are some valuable observations on the African trade, by Admiral A. P. E. WILMOT.

766. OATMEAL or ground oats. Eight sacks of Irish go to a ton. An Admiralty barrel contains $7\frac{1}{2}$ bushels or 360 lbs. net, half-hogsheads $5\frac{1}{2}$ bushels or 253 lbs., kilderkin $3\frac{1}{2}$ bushels or 172 lbs., small cask $2\frac{1}{2}$ bushels or 115 lbs., second size small cask 2 bushels or 101 lbs.

767. **OATS.** For dunnage, &c., see grain. A ship can take a full cargo, and if tender, ballast will be necessary. The steamer *Zealand*, 700 tons, of and for Hull, from Konisberg, was lost 11th September, 1863, in the Baltic, owing in a great measure to her rolling through the "lightness of her cargo." Oats do not require shifting boards; they should be closely packed, or considerable freightage will be lost; they are usually trodden down by foot; sometimes a stone roller or a cask full of water is used—an operation which wheat will not bear. On the West Coast of Ireland, masters should be careful as to the mode of weighing; see the article grain, sec. 409. Like other seeds, they are highly hydrometic, take up moisture freely, and thereby become heated in the hold. When shipped in a green state there is frequent loss of weight, which causes dispute on discharge, unless the contingency is provided for in the charter-party. For Australia, oats are often packed in hollow ware, and in spaces left by loaves of refined sugar and certain other articles in boxes and casks. Dutch cheese stowed in oats, were found in a liquid state on arrival at Port Philip. Spelter stowed on oats has caused the grain to become heated and discoloured; see steamer *Imperial*, in the article stevedore. A ship brought from Odessa a cargo of tallow, oats, and staves; the staves were put on the skin, tallow on them; oats over all; during the voyage, the heat of the oats melted and wasted the tallow, which ran among and injured the staves, causing a heavy loss to the ship. The Dutch galiot *Weibergina Martens*, Capt. BALK, loaded oats at Groningen in 1864, left 16th December, and arrived at Plymouth on the 20th. She registers 84 tons Dutch and 70 English, length 74 feet, breadth 19½, and depth 9 feet. Cargo, 828 quarters of black oats, 38 lbs. ♂ bushel; draught aft 7 feet, forward 6½ feet; with 132 tons of iron 8½ and 8 feet. Oats by manifest 825 quarters of 38 lbs. ♂ bushel; delivered 828 quarters; per imperial measure 812 quarters. Dunnage, wood, 5 inches deep, covered with mats, of which 40 were used.

768. **Improper Stowage.** In the Common Pleas, 19th December 1866, before Lord Chief Justice BOVILL. *WIEN v. NORWOOD*. In the course of the previous April, plaintiff shipped at Konigsberg a large quantity of oats in defendant's steamer *Volga*. The bill of lading specified that they were in good condition and order. Between 800 and 900 quarters were stowed in the main hold. The ship arrived in London 24th April, when it was found that the oats were heated and damaged in consequence of a number of bales or bags of rags having been placed on them, which prevented the evaporation passing from the grain. The grain was taken down to the ship in wagons and carts, and was stowed in bulk in the bottom of the hold on dunnage wood, covered with mats. The body of the grain extended aft 46 feet in length, 25 in width, and some 6 feet in depth. Over it was placed the bags of rags, but it was stated that they did not cover the

entire surface of the oats in question. The grain, as stated in the bill of lading, was shipped in good order; several witnesses deposed that the damage was caused by the bags pressing down upon the oats, and preventing the evaporation passing from them. It was stated to be an unusual thing for bags or bales of rags to be stowed in ships on oats, and that they were liable to contain some dampness, and still further cause damage to the grain. It was also averred that, even if the grain contained some moisture, the placing of any great weight upon the bulk would tend to check evaporation, and therefore, it was an act of negligence on the part of the shipowner, which could have been prevented by the exercise of ordinary care. Defendant contended that it was a common thing, with steamers trading from the Baltic, to stow bags or bales of rags on grain; that the usual care was taken in stowing the oats in question in the main hold; that they did not sustain any damage from the bags, but that the oats suffered from their own improper condition when shipped. The jury found a verdict for plaintiff, damages £73 3s. *od.*

769. Short Delivery. In February, 1845, an action was brought at Hants, THOMPSON *v.* DOMINY, for £29 10s., value of 48 barrels oats. Plaintiff stated that the schooner *Julia* received at Youghal, by bill of lading, 1,303 barrels of 196 lbs. or 14 stone each, for Mr. GRANT, who sold them to Mr. DOMINY at 12s. 2d. $\frac{1}{2}$ barrel, free on board. On discharge 48 barrels were deficient. Defendant demanded freight, £53, on the quantity delivered, but plaintiff wished to deduct £29 4s. for the deficiency. Mr. Justice COLDRIDGE decided that the servant of defendant, by signing the bill of lading, admitted he had received the property, and upon that admission GRANT sold to DOMINY. Damages £29 4s.

770. Deficiency. Bristol County Court, 25th July, 1861, GLASS *v.* HABGOOD. Before Sir J. E. WILMOT. Mr. EDLIN stated that the action was brought for recovery of £22 9s., value of a quantity of corn received on board defendant's ship *Reform* at Cardiff. Plaintiff was consignee of the corn, which consisted chiefly of oats. The bill of lading, dated 30th May, 1861, shewed that 774 barrels of black oats, 196 lbs. each in bulk, and 150 barrels and 13 stones in sacks, were shipped. They were to be delivered in good order at Bristol; but on arrival there was a deficiency of 160 bushels, although the vessel had only been three or four days on the voyage. Mr. STONE, for defendant, contended that the deficiency arose entirely through sweating and shrinking; he called witnesses who described the state of the oats when shipped and when discharged. Mr. WAITE and Mr. BAKER, corn merchants, considered it impossible that a shrinkage of 4 $\frac{1}{2}$ cent. should take place on a four day's voyage from Cardiff to Bristol. His Honour said the question was whether the non-delivery of the oats specified in the bill of lading could be accounted for by natural causes, and if so, to what extent. He thought there had been considerable sweating, but he was not satisfied that the loss extended to so much as 4 $\frac{1}{2}$ cent., and therefore gave judgment for £11 10s., each party to pay his own costs.

Tonnage, &c. A ship which can stow 404 tons of 40 cubic feet, can carry 2,397 quarters of oats. A vessel which can take 318·7 tons by measurement, will stow 1,892½ quarters of oats. 603½ quarters of oats are equivalent to 500 barrels of tar; 1,260¼ quarters of oats are equivalent to 100 tons of clean hemp; 88·99 quarters of oats will stow in the same bulk as 68·47 quarters of wheat, shewing a difference of 22½ $\frac{1}{2}$ cent. For ordinary purposes, it is usual to estimate 7 quarters of oats to occupy the same space as 6 quarters of barley or 5 of wheat. On the Crinan Canal 7 quarters make a ton. Bengal and Madras

ton 12 cwt. When wheat is 1s. $\frac{7}{8}$ quarter freight, oats are rated at 9s. 4d. for the Mediterranean.

Measure. A bushel of oats weighs 35 to 43 lbs. ; see page 279. In Ireland they are sold by the barrel of 196 lbs., but this term barrel does not signify a cask. 60 Riga loofs are equal to 114 quarters imperial; a loof is 1 $\frac{1}{2}$ bushels. The Lubeck measure for oats is one-sixth larger than for grain. The *Admiralty* compute 1 cwt. of oats as 3.64 cubic feet.

771. OILS.

SPECIFIC GRAVITY OF OILS.

	Cub. ft.	Specific gravity.		Cub. ft.	Specific gravity.
Water (pure) ...	62.425	1.000	Petroleum	54.81	0.878
- Sea..... ..	64.05	1.026	Oil, Olive	57.12	0.915
Naphtha	52.94	0.848	- Whale.....	57.62	0.923
Oil of Turpentine	54.31	0.870	- Linseed ...	58.68	0.940

Where other liquids in bottles swell and tighten the corks, oils have a contrary effect ; it is therefore necessary, when practicable, to see that the bottles are well corked, and even then not to rely upon their continuing tight. Oils have a tendency to expand and burst the bottles or casks when completely filled in cold weather, and subsequently placed in a warm atmosphere ; this applies to steam-ships, especially in reference to the engine-room. All liquids have more or less the same tendency to burst under similar circumstances. When casks of oil are coopered in wet weather and then placed in a very dry part of the hold, especially if near any heat-producing goods, leakage follows inevitably. Oils should not be stowed near coffee, rice, shumac, cochineal, camwood, sapan-wood, guano, or any similar dry goods. Bones draw oil from casks ; the presence of a few shank bones among some casks, whether justifiable or not, has before now led to litigation on settlement of freight. When oil is shipped with skins, the oil should go at each end, although shippers sometimes desire it otherwise. Vegetable oils promote spontaneous combustion ; animal oils have not this property. Oils in casks or cases, should not be blocked off with bags of broken stowage, as in case of leakage spontaneous combustion may ensue—with gunny bags especially. The barque *Annie Comrie*, Capt. BALL, 339 tons, left Cochin 23rd December, 1865, with a cargo of fish oil, coir rope, coffee, ginger, and cocoa nuts. On the 12th April, 1866, in lat. 48° 40' N., lon. 7° W., a slight explosion took place in the cargo, and smoke began to escape aft. All the hatches were battened down and every aperture closed, and the *Hero of the Nile*, Capt. GRAHAM, from London, having hove in sight, she towed the barque to Plymouth, where the

fire was extinguished. The hanks of coir (dholls 2 to 2½ lbs. each) were jammed in between the casks of oil, fore and aft, and spontaneous combustion occurred in three different places.

772. For long voyages casks of oil should be "spunged," *i.e.* a piece of hoop iron should be nailed across the bung-hole. They ought always to be well slung and not suspended by can-hooks; occasionally they have false chimes, which increases the danger. Some recommend casks to be double bedded and double quoined, as the oil makes them liable to slide, and the second bed is recommended to meet this liability. When packed in strong casks, such as those used for sperm oil, they may be stowed bilge and cantline for several heights. In all English and American whale ships, the casks are stowed bilge and cantline, by which more than one-fourth of the entire space in the hold is saved. This mode can be adopted with all liquids in strong casks, when economy of space is an object. Casks of oil should be stowed over liquids in casks in preference to dry goods, and if possible they should not be moved afterwards. Oils will damage many description of goods, and often cause spontaneous combustion, when brought in contact with hemp, flax, cotton, rags, black-lead, &c. Paint oils are usually shipped for export in tins or iron drums. For the weights of various oils, see gravity, specific; for petroleum oil, see petroleum; and for cod liver oil, see Labrador.

773. In the **Mediterranean**, bottles of salad oil, in wooden boxes, called half-chests or dogs' houses, ought to be placed separately, for the rolling of the ship often creates leakage. September and October are the principal **months of shipment** of oil at Genoa, but it is shipped thence in all parts of the year. Oils from Leghorn and Genoa are exported in stone jars, usually covered with rough jacket or wicker basket, containing about 18 or 19 gallons each, and half-jars of 8 or 9 gallons; and are stowed on a platform on the top of the cargo, where they are lashed to the sides or bulkheads, and, to prevent them from falling against each other, are interlaced together with some of the grass in which they are packed. Small parcels of oil in cases, are sometimes used here and there to fill up the broken stowage; but this is dangerous. At **Leghorn**, oil must be kept at a distance from marble. Olive and other fine oils, especially when thickened by cold weather, are liable to be attacked by rats. Olive oil is made up at Leghorn in half-chests, containing 30 flasks or 2 gallons nearly. A chest of olive oil contains 60 flasks or a little over 4 gallons. Seville oil is packed in three sizes, called pipes, casks, and quarter casks; a schooner of 111 tons register, stowed

only 103 tuns of 252 gallons to the tun. Most vessels will stow about 10 $\frac{1}{2}$ cent. above their tonnage.

774. About the year 1854, the brig *Nernia*, of Dunkirk, laden with oil, was driven out of Marseilles on a Monday, struck by a heavy sea, capsized, and turned bottom up. Two of the crew were drowned. Five crouched up inside the hold, near the keelson, with the water up to their waists, unable to stand upright. They thus passed two days and two nights, and sought to appease the pangs of hunger by gnawing the bark of the cask hoops. Night was known from day by the light striking down from the sea, and being reflected up through the cabin skylight. Want of fresh air induced the mate to try for two days and a night to cut a hole; providentially his knife broke. On the Wednesday night the vessel struck the ground heavily; with the third blow the stern sunk so much that all endeavoured to go forward; in this effort another man lost his life. In the morning, the tide having fallen and the vessel having listed, the master found he could go down into the cabin, and called out "thank GOD we are saved, I see a man ashore." He came to look at the wreck, and on inserting his hand was greatly alarmed to find it grasped by one of the prisoners. The brig probably capsized owing to the light nature of her cargo, but no doubt the confined air assisted in keeping her afloat. At Lisbon a vessel was listed over for repair when she turned bottom up and the crew were imprisoned in the hold. Without first towing her ashore, those who observed the accident attempted to cut a hole in her. The attempt was scarcely commenced when the confined air escaped, the vessel sunk, and all in her perished.

775. At **Gallipoli** when the oil is to be shipped, it is drawn off from the cisterns into uteri or skins, and carried on men's shoulders down the sea shore to a small house in which there is a large open basin, capable of containing a given quantity, and of measuring the liquid; in that the porters empty their skins as they arrive. A tube communicates from the basin to a large cock at the outside of the house. When the basin is full, casks are placed under the cock. As the casks are closed up by the cooper, the porters roll them down to the brink of the sea, where the sailors secure several of them together with a rope, and taking the end into the boat, row off to the vessel. Each porter being able to carry but a small quantity, the number of men and boys employed is considerable; and as they are an active fine-limbed set of fellows, going with their legs and arms bare, and running up and down and crossing each other with their oil skins, on their way to and from the town, and as they delight in

singing, and moreover, frequently sing well in parts and concert, the scene presented is often very animating. The casks are made of any size required, from one to six salms, and it is generally calculated that 93 tons can be stowed to every 100 tons register. The *British Queen* (see sec. 320) took in 110 tons net Gallipoli oil in 1846, and the same quantity in 1848, and only 93½ tons in 1862. The cargoes were equal in bulk, but the staves of the casks used in 1862 were much thicker. She took in 102 tons at Messina in 1854. A colonial-built brigantine, rather sharp, 149 tons register (1856), took 148 tons; she had 10 tons of ballast, and would have required more, but was stiff; length 95½ feet, breadth 23½ feet, depth 12 feet. At Mogadore and Sicily the stowage is not so good; at Palermo 80 tons of oil is usually calculated to every 100 tons register.

776. **Palm oil** casks require to be well white-washed with three coats, to fill worm holes, &c.; make the white-wash with salt-water; commence stowing at the pump-casing. In the Bonny River on the West Coast of Africa, casks of palm oil are of various sizes, from 10 to 44 inches across the head; they are quite tight and require no dunnage. Excepting when it is necessary to trim by the head or stern, no ballast is taken. A vessel which stows her register tonnage, net weight, is considered to stow well. Palm oil is very injurious to rope, canvas, and camwood.

777. Admiral A. P. EARDLEY WILMOT, some time Commodore of the naval squadron, says 26th October, 1867:—Anyone who has been on board a “palm-oiler” will scarcely wish to repeat his visit. The stench and filth are dreadful, and are much increased in Africa by the terrible heat of the climate. The oil on the deck of the vessel from the leakage of the casks, which is carried to all parts of the ship by the feet of the seamen, is quite enough to engender disease without the unavoidable adjuncts under such circumstances. Vermin of all kinds abound—cockroaches in tens of thousands, while the mosquito does not add to the refreshing slumbers of the crew. There are many captains who take the greatest care of their crews by providing proper awnings, &c., and enforcing order and sobriety; but these are the exceptions and not the rule. Little encouragement is given to those pursuits which tend materially to break the monotony, so much to be dreaded on these shores. Books and light reading to while away the tedious hours of the day when not at work, are little thought of, and hence the sailor is left to his own resources, which being few he indulges in the bottle whenever he can get it, because he literally has nothing else to do. It is the duty of the captains to fight against the climate as much as possible,

and enforce everything that can tend to health and cheerfulness. I do not believe that ablutions are ever thought of by the men, unless at their own convenience, but not as a sanitary measure ; and we know from experience that nothing tends more to health and cheerfulness than a good wash every morning. In our ships of war this is a *sine quâ non* ; hence the health of our seamen when compared with the merchant service. In these traders the men scarcely ever change their clothes from one week's end to another. How is it possible, then, that health can be preserved ? Then, again, look at the fore peak in which they live—not large enough to hold a tenth part of the number in comfort—dirty and stinking ; for there is no use in mincing the matter. It is not a place for human beings to live in in such a climate. In most merchant vessels it is bad enough, but in these it is dreadful. I am not arguing that Africa is a healthy climate. God forbid ! An experience of 17 years tells me quite the contrary ; but I affirm that many a life may be saved and much disease prevented if proper precautions are taken, and the captains unite with the men in observing moderation in their living, cleanliness in their persons, cheerfulness at all times, particularly in the long evenings after work, a mutual desire to avoid unnecessary exposure, common sense in administering quinine and other medicines at the proper time, as well as making the Sabbath-day a day of recreation to the mind and refreshment to the body, when the crews of all the ships can meet together if they like and pass their time in friendly conversation and intercourse. Captains must show those under them an example themselves of all the decencies of life, and, if so, the crews will surely follow in their wake, and not only will the life of many a fine fellow be spared to return to his native country, but the natives themselves will receive a lesson that must prove of incalculable benefit in, and go far towards, the civilization of their race.

778. **Cocoa-nut Oil.** Avoid taking more than a ground tier at Ceylon, where it is shipped in the bottom, with coffee in casks or bags over, and although there may be six inches of dunnage between, usually cajans (tops of cocoa-nut trees), and rattans, deer and buffalo horns, and coir junk, which are shipped for dunnage at half freight, yet the heat of the coffee draws the oil, and much of the lower tier, especially if in bags, is tainted by it, and is then termed "oil damaged." In iron tanks oil is not subject to this disadvantage, but is apt to become discoloured. [Some masters recommend that when carrying cocoa-nut oil, auger holes should be bored in the pump-well about a foot above the skin, to admit the water to the pumps, in case the leakage from the oil sets in the hold and makes

the pump-well so tight that water will not go through ; these holes should be a foot above the skin, so that the dirt, coal, coffee, or anything else in the hold may not choke them.] Large quantities are exported from the East Indies, in casks of about 68 gallons each—beer casks usually. The **season for shipment** there is all the year round, but principally during the north-east monsoons. Cocoa-nut oil in small quantities is best stowed in the ends, both for making the ship easy at sea, and for preventing damage to other cargo, in case of leakage. At Ceylon, and on the Malabar Coast, &c., the ground tier consists often of pipes of 200 and 250 gallons, with lesser casks, say beer casks for stowage. In cold latitudes there is little fear of leakage of cocoa-nut oil, which becomes as thick as lard, but melts speedily on entering a warmer region. It does not freeze until the temperature is reduced to 73° Fah. All perfumed essential oils from Colombo, are carried in poop cabins ; one pint bottle full placed in the hold will spoil an entire cargo of tea.

779. Considerable danger is incurred when loading cocoa-nut oil at **Colombo**, especially during the south-west monsoons. It comes off in small boats, and the casks, which weigh a ton each, are so large and cumbersome, they are liable to be staved alongside, or to get out of the slings when the boats are knocked about by wind and sea. Ships engaged in the trade are furnished with a proper derrick, which fits with a goose neck on the mainmast, the safest mode, as there is not so much swing with it. In May, 1861, the barque *Admiral*, 350 tons register, Capt. ELLISON, left Colombo with say 100 tons oil, 200 tons coffee in bags and casks, 50 tons plumbago for broken stowage in the lower hold, 16 tons (measurement) cinnamon, and 50 tons coir in yarn. She is about 117 feet long, 23 broad, and 15 deep. So laden she drew 15 feet aft, and 14½ forward, was very lively at sea, and delivered the cargo in good order. The oil being well quoined, was stowed in two tiers on the floor ; the plumbago went to fill the broken stowage ; the remaining spaces were filled up with coir, bundles of which were spread over the whole to a depth of one foot when pressed by the upper cargo. Mats were laid on the platform of coir, and rushes placed against the sides. Here the coffee was stowed, and then covered with coir to receive deck leakage. The cinnamon was placed just clear of the main hatchway, completely enveloped in coir.

780. At **Cochin**, on the Malabar Coast, the best season for shipment is in December. Large quantities of cocoa-nut oil are shipped there with coir junk and yarn, and the cargo completed at Ceylon with coffee. The oil should be kept clear of all these. The

iron barque *Eaglet*, 392 tons (Capt. JOSEPH GINDER), 135 feet long, 26·1 broad, 15·8 deep, and has a height of 'tween decks of six feet, left Cochin 17th December, 1864, with

		Tons.	Freight.		
			£	s.	d.
381	Casks oil	215	956	7	0
1,133	Bales coir yarn, 50 cubic feet to the ton	219	818	2	0
100	Coils coir rope	5	14	18	3
30	Chests of cinnamon	5	17	1	3
15,000	Pieces sapan wood	21	30	15	7
8,625	Dholls coir.....	28	21	14	7
33	Casks wine.....	20	112	10	0
		505	£1,978	9	5

The oil and wine were stowed in the lower hold; coir, &c., in 'tween decks. The sapan wood, with firewood and mats, was used for dunnage. So laden she drew 13½ feet aft and 13 forward, her best trim at sea; with a dead-weight cargo of oil and wine 14½ and 14 feet. **Port charges** at Cochin, in and out £4 18s. (49 rupees); pilotage in £3, out £3. During the south-west monsoons (April to September) it is scarcely possible to get out of Cochin without steam, as the wind and sea are constantly driving into the harbour. From September to April (north-east monsoon) the land breezes enable vessels to leave at midnight or early in the morning, when three shore boats at a cost of about £1, are stationed at the buoys with lights. As there are only 15 feet on the bar, it is very necessary to know the state of the tides. A vessel drawing 14 feet only might cross without risk. The *Eaglet* requires steam during neap tides, when the land winds are not sufficient to carry over the floods so as to meet high water on the bar. There were no regular tugs in 1865, and ships were usually plucked out by coasting steamers, which called twice a week on their passages to and from Bombay and Galle. The *Eaglet*, for this service, paid in 1863, £30, and in 1864 she was to have paid £25, but the steamer could not leave in time.

781. **Copra.** In the Common Pleas, 5th July, 1864, before Justice ERLE, KOEBEL, merchant, sued SAUNDERS, underwriter, for £200, his proportion of a policy. The ship *Flore* took in at Cochin 645 casks of oil, and for broken stowage a quantity of loose copra—the meat or kernel of the cocoa-nut dried. Heavy weather occurred, the hull was not damaged, but nearly all the oil leaked out. At Marseilles, surveyors attributed the leakage to the working of the ship and the heat produced by the fermentation of the copra, in

consequence of its being damaged by sea-water which passed down through the deck. Defendant contended that it was improper to stow copra between casks of oil. Verdict for plaintiff for £1,025 on the entire policy. In the Court of Common Pleas, 26th January, 1865, the damages were reduced 10 p cent.—£884.

782. **Castor-oil** is generally in air-tight tin cases, covered with wood; if put on the beams, the leakage will run along and damage other goods. In Bengal it is often packed in very leaky cases requiring much care. Careful masters place castor oil by itself, under tanks, or alongside chain lockers where it can be piled right up, so that all the leakage will run among the oil packages and not into other goods. The principal season for shipment in the East Indies is during the north-east monsoons.

783. At **Sydney**, large casks for sperm oil are well bedded and quoined clear of the wake of the hatchway, so as to be free from the liability of injury when other goods are lowered or dropped into the hold; also to prevent such goods from being injured by contact, to which they would be more liable if the casks were near the entrance. A wooden horse is laid across the hatches, having slung to it underneath a half-cask with a hose of large dimensions, not easily clogged. Through this funnel the oil is conveyed below. It is brought to the ship in lesser casks, which are placed on the horse with the bung-hole not directly over the funnel, but inclined so that a man can conveniently clear it with a stick when clogged, it being usually so thick as to require frequent stirring. Should the ship be light and the weather boisterous, it is necessary to check the casks, or they will roll over the horse. Before being placed on it the bungs are enveloped in canvas, by the fag-end of which they are suddenly jerked out when all is ready.

784. **Whale Oil** is shipped in casks from 40 to 300 gallons; the tun, according to SCORESBY, weighs 17 cwt. 29 lbs. 12 ozs. 14 dr. Great care is required in stowing; the largest first; no dunnage; see dry rot, wooden ships, &c. Charters for oil have sometimes been erroneously accepted for tuns, 252 gallons, instead of tons of 200 gallons or otherwise. The guaging of casks of oil was dispensed with by the Customs in 1853; they are taken as 126 gallons to the pipe, and 63 to the hoghead.

785. **Nitro-glycerine** is a manufactured substance, composed of glycerine, nitric and sulphuric acids; it is called nitro-glycerine, glonoin oil, and NOBEL'S patent blasting oil. It is exploded by concussion, and apparently, under ordinary circumstances by nothing else—neither by friction nor fire. Generally a trifling percussion is

sufficient to explode it; its explosive force is about ten times that of gunpowder. It is usually carried in tin cans, holding each about 25 lbs. weight of the oil; it has all the appearance of ordinary oil; so that there is nothing in itself, or in the tins used for its carriage, to give notice of its dangerous nature. The cans are packed each in a wooden case, for carriage by land or water. A notice from the Prussian government states that "according to present experiences, the sudden explosion is occasioned by strong heat as well as by the effect of a shock, and by compression. The transport and the warehousing of this article can only, therefore, be allowed under such conditions as to exclude the possibility of a contact with great heat, as also of any shock or pressure. The transport of nitro-glycerine by land or by water, especially also by rail, can therefore only be allowed under the same conditions as those referring to the transport of ignitable jars, in addition to which we issue the following orders as further means of precaution: the nitro-glycerine must be packed in bottles, made either of tin or strong glass. The bottles must be closed by a stopper of cork, not of glass. The glass bottles used for the transport of blasting oil must be cased with cork, having an inside lining of straw. These packages, the tin bottles as well as the incased glass bottles, must be packed in tight wooden cases, straw, hay, or such like, to be used for packing. The cases must be marked 'sprengel' or (blasting oil) on the outside. As the nitro-glycerine, in a temperature of a few degrees above zero crystallizes, and is in this condition, according to experience, more likely to explode, a greater amount of care is recommended during the colder seasons."

786. On the 4th August, 1869, the *Mary Philip*, of Padstow, Capt. CURNOW, left Gallipoli with a cargo of oil for St. Petersburg. The oil was of a peculiar description, said to be the first full cargo of the sort sent to Russia from the Mediterranean; it is used for the manufacture of waterproof clothing. This oil is packed in casks having very thick staves to meet the casualties of a long passage. The thickness of the staves tells against the quantity of oil delivered, on which freight, in this instance, was paid. The bills of lading were not sufficiently explicit about the terms of the charter-party, but all the master could do was to sign under protest, as advised by the British Consul. The casks were large, about 1 ton or 1½ ton each. The *Mary Philip* registers 116 tons, is 87 ft. long, 21½ broad, and 11 ft. 8 in. deep. She is oak-built, and has no beams or knees. With the cargo of oil she drew aft 10 ft. 1 in., forward 8 ft. 6 in.; with 195 tons Cardiff coal, not quite full cargo, 11 ft. 3 in., and 9 ft. 9 in.; her best trim at sea is aft 11 ft. 3 in., forward 9 ft. 9 in. She

had 12 tons of ballast, but the master found, when laden, that 6 tons would have been sufficient.

787. **Palm Oil and Kernels.** In September, 1869, the *Mary Campbell*, 165 tons, Capt. BRIGHT, left Lagos for London, with a cargo of palm oil and kernels, having a crew of nine hands, every one of whom, excepting the cook and boy, were suffering from African fever, the mate and one man being totally incapacitated from duty. The mate died on the 4th of September, the heat from the palm kernels being very great. There was no improvement in the state of the crew after getting to sea, and they continued unable to properly perform their duties. On the 23rd, the weather being squally, the topgallant sails were blown away from the yards. The vessel ran under topsail in the cap, and foresail, there being no hands to reef, five of the crew and the captain being sick. On the 24th the captain succeeded in getting the topsail reefed, and on the 25th the wind moderated, but the vessel continued to labour, and commenced making water, and on trying the pumps, oil and kernels came up. On the 27th the wind increased, and the bulwarks and jolly boat were washed away. On the 28th the vessel sprang a leak and the water rapidly increased, the pumps becoming choked and useless. On the 29th the masts were cut away and the vessel partially righted, but the water was within two feet of the upper deck. All hands (sick included) were kept at work baling out of the cabin hatchway. On the 1st of October, the weather having moderated and the vessel being on the point of sinking, the crew were placed in the one remaining boat, which had been much injured by the violence of the gale, and a lashing had to be passed around her to keep her together, while the men were constantly baling. On the 2nd it was found necessary to lighten the boat, and all the clothes were thrown overboard. Immediately after the boat left she was lost sight of. On the 3rd of October the boat was picked up by the barque *Rosalind*, of Liverpool, bound for Matanzas, having run about 200 miles. Had not the unhappy men been picked up they could not have lived another night. In palm oil ships, clothing, the stitches of boots, &c., rot very quickly.

788. **Paraffine.** One of a number of casks 22½ to 23½ inches broad at the bung, by 31 to 33 inches long, weighed 3 cwt. 1 qr. gross.

789. **Brindisi.** A quintal is 100 kilogrammes, French or Italian, on the metrical system = 220½ lbs. English. The usual measure is 7½ salms, same as in Gallipoli (or 1,060 kilogrammes by weight to the tun English), which should render again in Great Britain, after allowing for ordinary leakage, &c.

790. **Dilo**, produced in the Fiji Islands, is very effective in cases of rheumatism; it is the woondel or bitter oil of Indian commerce, and brings £90 to the ton in European markets.

791. **Damage**. Among consequential damages must be placed that done to goods by oil, by tar, and by bilge water, no one of which ought to have had any proximity to dry goods. It may happen from want of proper stowage and dunnage; but it may also happen through sea perils, from there being so great a leak that the oil and tar which may have escaped and found their way to the bottom, may have been up-borne by the water in the ship and deposited on the goods, which may nevertheless have been properly stowed. If an interval elapse before they are discharged and inspected, the only traces that remain may be those of tar and oil, and it would require the master to explain how the tar, the oil, or the bilge water, were thrown and left on the goods, in order to relieve the ship. The effects of concussion, stranding, and heaving down of ships by seas, are extraordinary, and such in some cases as would be deemed incredible. Goods which were placed at the bottom have been tossed to the top; bars of iron shifted from a longitudinal to a transverse position, &c. Damage to goods is not confined to sea-water as a cause. Damage occurring in rivers by fresh water is equally claimable. It is not likely to create so much injury as salt water, and it is not so easy of detection. Sea-water damage is commonly tested by the tongue.—*Hopkins on Average*.

792. **Leakage**. In *CROFTS v. MARSHALL*, where oil had been lost by leakage caused by the labouring of the ship in a cross sea, Lord DENMAN refused to admit evidence of a usage at LLOYD'S to the effect that unless the cargo was shifted, or the casks damaged, underwriters were not liable for any extent of leakage, however caused, as a loss by the perils of the sea. His lordship told the jury to consider whether in their opinion the damage to the oil was in fact caused by the perils of the sea. "It may be very convenient," said his lordship, "for the underwriters to have such a general rule, and for the commercial world to submit to it, but if they mean thereby to control the effects of a plain instrument, they should introduce its terms into the policy."

793. **Leakage, U.S.** Loss by leakage having arisen through the exposure of casks of oil to the sun at New Orleans, for two days before shipment through the negligence of the shipowners, it was held by the District Court at Massachusetts, May, 1856, that the consignees could claim for the loss although it happened prior to the date of the bills of lading, as the liability of the carrier commences with the receipt of the goods.

794. **Olive Oil**. In the Admiralty Court, 3rd March, 1865, Dr. LUSHINGTON gave judgment in favour of Messrs. BRISCALL, who sued the owners of the Prussian ship *Hélène*, which in the previous August received 47 casks of olive oil at Leghorn for delivery at Liverpool. The quantity shipped was 4,800 gallons; of this 2,000 gallons had been lost by leakage. Dr. LUSHINGTON said that ordinarv

leakage does not exceed 1 $\frac{1}{2}$ cent. Plaintiffs allege that large quantities of rags and wool were stowed near. Defendants state that leakage arose through the slackness of the casks and heavy weather. It is not probable that large exporters like Messrs. LLOYD, of Leghorn, would use inferior casks, besides some of them were sold at the usual price. Stowing wool with oil is risky. I am compelled to conclude that accompanied by insufficient ventilation, the intermixture of the wool was the chief cause of leakage. Although the charterers appointed a head stevedore, yet he was "subject to the master's control." Judgment for plaintiffs, with costs, and reference to the registrar.

795. **Benzine—Explosion.** In 1865, the steamer *Athanasian* was lying at Havre, laden with benzine oil, of which there were on board eight butts, containing 100 gallons each. The chain broke when one was being hoisted out, and it fell in the hold and burst. Nothing was done, and three hours after one of the men went down with a lighted lantern. Another, seeing the danger, warned him, first, and then with some of his comrades contrived to escape. A terrible explosion took place. Three men in the hold were killed and one frightfully injured. The ship took fire which was subdued by the engines. Two sappers volunteered to search for the bodies, and were lowered down by a chain fastened round their waists. The hold was full of water covered with benzine. Unfortunately, one of the sappers had a lighted torch in his hand, from which a drop of resin fell and caused a second explosion, which burned and blackened the sappers so that they could scarcely be recognized. The fire was again extinguished, and a pumping engine on the MAURY system, brought up 150 tons of water in little over one hour.

796. **Fatal Explosion.** A terrific explosion occurred 3rd May, 1866, at 7 a.m., on board the steamer *European* alongside the Railway Co.'s wharf at Aspinwall; the upper part of the ship was torn away and several plates were blown off her side. The plank wharf, nearly 400 feet long, was torn to pieces and completely demolished to within a hundred feet of the freight house. Both ship and wharf took fire, which after several hours was extinguished by the engines. On board the *Caribbean*, lying near, several immense iron girders were snapped like pipe stems; all the boats and everything of a fragile nature was rendered useless. Capt. COLLE, Mr. GLASS, chief officer, and about fifty of the crew and others employed on board the *European*, lost their lives. The explosion is attributed to the fact that she had on board 70 cases of glonoine or nitro-glycerine. The Royal Mail Steamer *Tamar*, Capt. MOIR, which arrived the previous evening, prepared to tow out the burning ship, but before this could be done a second explosion took place, supposed to have originated in the magazine which contained a small quantity of powder. The *Tamar* then made fast, and the two had barely reached the opposite side of the bay when another explosion more terrific than the first occurred. The *European* was thus broken in two and she sunk; her mainmast was sent high in the air, and had it fallen on the deck of the *Tamar*, the most serious consequences might have ensued. Capt. MOIR and his officers were very properly thanked by the Italian and French consuls and several other officials. A Naval Court which sat immediately afterwards, came to the conclusion that the first explosion (70 cases of glonoine) took place in the lower after 'tween decks; the only survivor being a man employed immediately underneath; and that the third explosion originated among some goods shipped as "merchandize." There was a shipment by Messrs. JOSE F. TOURSCHITZ, of Liverpool, described in the bill of lading as 'R. E. 1 to 44, Merchandise.' One

case marked 'R. E. 25' was recovered; under an outside layer of quill pens it contained 100,000 percussion caps.

Proportionate Tonnage. 17 tuns of oil, of 252 gallons each, weigh $18\frac{1}{2}$ tons, and will occupy 850 cubic feet or 1 keel. When Mediterranean wheat is freighted at 1s. $\frac{7}{8}$ quarter, oil in casks should be 7s. 6d. $\frac{7}{8}$ tun of 252 gallons.

Tonnage for Freight. 250 gallons Ceylon oil in casks, measuring about 60 cubic feet, go to the ton; in tanks 50 cubic feet. At New York and Baltimore, 200 gallons (wine measure), reckoning the full contents of the cask. Bengal and Madras ton 20 cwt. in cases; Bengal any kind in casks 20 cwt.; Madras 210 imperial gallons. Bombay ton in casks, 50 cubic feet. In China, a case of aniseed oil containing 1 pecul, measures 5'16 feet; half a pecul 2'564 feet; pecul Cassia oil 5'45, and half a pecul 2'80 feet.

FOREIGN OIL MEASURES.

BREMERHAVEN.—A barrel of whale oil=6 steckan or 216 lbs., net = $3\frac{1}{2}$ wine gallons English.

CANDIA.—In Candia (Mediterranean) oil is measured by the mistate 2'456 gallons.

CERIGO (IONIAN ISLANDS).—A barile 14'0298 gallons.

DENMARK.—A last 224 lbs. net.

HAMBURG.—1 English imperial gallon olive oil is about $8\frac{1}{2}$ lbs. Hamburg weight, 1 tun fish oil imperial usually renders 58 Hamburg steckans; see coffee.

ITALY.—A frasco is less than 4 pints; a rubbio $47\frac{1}{2}$ lbs.; *Rome*, a barile 15'185; *Palermo*, the caffiso= $4\frac{1}{2}$ English gallons; *Venice*, the orna is divided into 100 lire, and is equal to 14'29 imperial gallons; the botta contains 2 migliaje, or 80 miri of 25 lbs. peso grosso; a miro= $4'028$ English wine gallons; *Florence*, a barile 9'6338 gallons; *Genoa*, 17'083 gallons; *Lucca*, a coppo 200 lbs. nearly.

INDIA.—A garce contains 400 marcalis= $9'256\frac{1}{2}$ lbs.; *Malabar*, $3\frac{1}{2}$ gallons make a choradany; *Travancore*, 30 choradaines make 1 candy of 8'203 gallons.

LISBON.—A blade is the tenth of a pipe; a last 4 pipes.

MALAGA.—A bota is 43, and a pipe 35 arrobas; the latter weighs about 160 lbs. avoirdupois; the arroba 4'19 English wine gallons; a last=4 boats or 5 pipes=5 pipes Pedro Ximenes.

MALTA.—A quartruccio= $1\frac{1}{2}$ wine quart; the caffiso= $5\frac{1}{2}$ English gallons, some say 4'580 gallons; the barrel is double the caffiso; some say 9 gallons.

ROTTERDAM.—A last 4 casks olive oil or 7 casks whale oil.

SARDINIA.—A pot 17 pints.

SPAIN.—A quartella 0'829 gallons, the arroba 2'78 gallons, is divided into quartillos or 100 panillas—the standards of the arroba are 34 libras of water, and 25 of oil; libra 1'0144 lbs.; *Cadix* botta $38\frac{1}{2}$ arrobas, pipe $34\frac{1}{2}$ arrobas.

TRIPOLI.—A carraffi $3\frac{1}{2}$ lbs.; a mattaro 47 lbs.

TURKEY.—The alma or meter=1 gallon 3 pints English wine measure; weight 8 okes or $22\frac{1}{2}$ lbs. avoirdupois.

Oils are in some foreign places sold by spirit and wine measure, which see.

797. **OILCAKE** is the remains of various seeds after they have been pressed for the extraction of their oil. In bulk, oilcake should

be placed by itself; in bags or casks it may be put on dry goods, but they should be well matted where necessary, for if the weather be close and warm the oil will perforate through the sacking. Oilcake may cause spontaneous combustion if its exhalations reach cotton, hemp, jute, &c. If placed too near the ceiling, although the ship may not leak, the cakes will draw dampness from the wood; at the same time they may leave a dampness in the wood not easily removed. In the case of the *Sir T. Graham*, M'ANDREW v. LIDGETT, Queen's Bench, March, 1854, it was held to be not proper stowage to fill up the spaces between the casks of turpentine with oilcake, which caused the casks to shrink and leak on and injure barrels of currants below. The ship *Figlia Maggiore*, Capt. G. MILLOSEVICH (a general ship), left New York, June 26th, 1865, for London, with a cargo including 556 hogsheads tobacco, 18,000 staves, 40 cases merchandise, and 1,000 barrels oilcake. The goods were mixed together, the oilcake was found damaged on arrival, and an action was brought in the Admiralty Court, 21st April, 1868. Sir R. PHILLIMORE, in delivering judgment for plaintiff, said that the mould in these oilcakes was from the edges to the centre—the usual indications that the mischief had been produced by external heat. Tobacco and oilcake were both heat-producing.

798. The schooner *Fairy*, belonging to Boston, Lincolnshire, which registers 141 tons, loaded in December, 1864, at Marseilles, 212 tons of ground-nut oilcake, which became heated on the passage to Plymouth, where she arrived 12th January, 1865. The heating was ascribed to being shipped in a green state, as the steam from the entire cargo settled against the decks and then dropped; the upper part suffered most. The *Fairy* is sharply built, and has in the hold a permanent platform fixed on her two sister keelsons; it is 17 inches above the floor; thick single mats were laid on the platform against the sides to receive the oilcake. She drew 13½ feet aft, and 11 feet 10 inches forward. With 230 tons of coal, 13½ feet aft, 12 feet forward; best trim at sea, 12 feet aft, and 10 feet 7 inches forward. Her nut cake was extracted from ground nuts, partly manufactured at Marseilles; the remainder came from other Mediterranean ports. Capt. GODLEY considers that nut cake is very liable to become heated; rape-seed cake will, if new, but not so quickly as nut cake; and linseed cake less than either. The *Fairy's* port charges at Marseilles were—**Pilotage** in and out 44*f.* 10*s.*; excise on ship's stores, &c., 17*f.* 50*s.*; health office 14*f.*; harbour boat as agreed 10*f.*; clearing in and out (140 tons) 60*f.*; telegram 10*f.* 50*s.*; opening bridge twice 22*f.*; sundries 66*f.* 90*s.*; total 244*f.*; consulate 15*s.*; steve-

dore's charge 4*d.* $\frac{1}{2}$ ton. For discharging pitch 3 sous per ton per man—four men employed. The charge for cooking ashore is 1*½**f.* per day per ship.

799. **Bones.** The Court of Admiralty, 4th March, 1870, before Sir R. J. PHILLIMORE. Mr. MILWARD and Mr. COHEN for the plaintiffs; and Mr. BUTT and Mr. E. C. CLARKSON for defendants. On the 3rd of September, 1868, Messrs. CAMPBELL and THAYER, of New York, shipped 3,000 bags of oilcake on board the *Freedom*, consigned to Messrs. SIMMONS and HUNT, of Mark-lane. Only about 300 bags were delivered in good condition. Plaintiffs claimed as consignees of the goods and assignees of the bills of lading. The defence raised was that the plaintiffs had no title to sue for negligence; that they could not sue as consignees in contract; and that the damage was occasioned by the dangers of the sea. The hearing occupied several days, and the Court having taken time to consider the decision, now gave judgment.

Sir R. PHILLIMORE was of opinion that, following the decisions of the Court in recent cases, plaintiffs had a *locus standi* as to negligence, breach of contract, and also for the loss sustained by them in consequence of an improper mode of delivery. With regard to the non-delivery according to marks and numbers, defendants denied that they were bound to sort and weigh the goods on the ship before delivery. It was proved that the delivery according to marks and numbers was demanded by the consignees and refused by the master. Plaintiffs, under the terms of the bills of lading, were entitled to have the goods so delivered, and as that was refused, they were entitled to compensation for any loss sustained by reason of such refusal; but the really important question in the case related to the liability of the owners for the state of deterioration in which it was proved the cake was when it arrived. The fact of the damage having been proved, the burden of proving affirmatively that such damage was within the excepted perils, or that it was due to the intrinsic properties of the cake, was upon defendants. It had been admitted that the cake was in good order when it was put on board at New York; and the Court was satisfied upon the evidence that the amount of deterioration was not due to any inherent vice or intrinsic property. With respect to the contention that the damage was caused by the perils of the sea, the question arose, what was a peril of the sea? It was admitted that bad ventilation, defective stowage, the neighbourhood of a heating cargo, or a distant heating cargo of such a nature as would throw off heat to affect the whole cargo, would not fall within the category of peril of the sea. But it was contended

that sea-water, the warmth of the water in the Gulf Stream, and a state of weather which rendered it necessary to keep the hatches closed during a portion of the voyage, and the condensation of steam consequent therefrom, were the causes of the damage, and that these causes fell within the category of excepted sea peril. The evidence as to the weather was not what the Court could desire; the log-book of the ship was not produced at the hearing, and it did not appear that any protest was made against the damage to cargo caused by bad weather. A portion of the cargo consisted of bones; it was admitted by the master that when he arrived in England some of the bones were moist and mouldy, and another witness said they were covered with fungus called "stinking fungus." His lordship then said—Looking to the facts proved with respect to the condition of these bones, and to the opinion of experts on the inferences of science applicable to such a state of things, I have arrived at the conclusion that the damage to the oilcake was caused in great measure, at least, by the presence of these bones on board the ship. But this conclusion does not appear to me necessary for my judgment in favour of the plaintiffs. In my opinion, it was incumbent upon the defendants to show that the extensive damage done to their cargo was caused by "dangers of the sea," which is the only exception contained in the bill of lading. I think that upon the evidence before me they have failed to do so, and on both grounds, therefore, I pronounce for the prayer of the plaintiffs, and make the usual reference to the registrar and merchants.—Judgment accordingly.

800. **Stowage and Delivery.** *SIMMONDS v. DRIVER.* Common Pleas, 12th November, 1862, American ship *Daniel Webster*. Before Mr. Justice WILLES. An action for loss sustained through the improper stowage of oilcake shipped at New York, and also for delay in delivery. Defendant pleaded that there had been no negligence on the part of the ship, and that the loss arose from the perils of the sea. Plaintiffs were oilcake merchants, and defendant was master, and according to plaintiffs it appeared that towards the close of 1861, 500 bags and 40 barrels oilcake consigned to them, were shipped in the *Daniel Webster*, and on her arrival in London docks it was found that about 70 tons of the oilcake in bags were damaged through being wetted and becoming heated, and a quantity of wheat getting mixed with it. It was alleged that this could only arise from the cake being improperly stowed, and in too close proximity to the wheat, in bulk, where it would be more likely to get heated, and that if ordinary care had been taken the cake would neither have been heated nor the grain driven into it. The loss was estimated at £1 a ton. There was also a further claim for compensation upon the ground that defendant had not delivered the cake within a reasonable time, that the lighterman had applied for the consignment, and that had ordinary dispatch been used, it might have been delivered much earlier. In consequence of this delay, plaintiffs lost the market. The defence was, that the oilcake was stowed in the usual and proper manner, in the after part of the

main hold, and that the damage arose from the perils of the sea, which came within the exceptions of the bill of lading. The cargo was stowed by the usually appointed stevedores, and there was a bulkhead two inches thick between the wheat in bulk and the after hold, and the cake. The ship left 20th December, and on the 25th, in a heavy gale, she strained, and made considerable water. On the 31st, another heavy gale threw the ship on her beam ends; she remained so until noon, 2nd January, labouring with her lee rails under water. She had a list of from four to five streaks on the port side. When righted she had 22 inches of water in the hold and the cargo had shifted. The water which she made kept in the bilge when the ship listed over, and so must have got to the cargo. Capt. BOWERS, inspector in the London dock, stated that the ship appeared to have had very bad weather. A bulkhead divided the wheat from the oilcake, and it was thought that the heavy straining must have caused it to yield, and so have allowed the grain to pass through with the water to the cake. Some peas and hops were also damaged by sea-water. Those who assisted in unloading spoke of the cargo as having been properly stowed: and with regard to the delay in the delivering, it was stated that the discharge of a ship of the tonnage of the *Daniel Webster* occupied from three weeks to a month, and that all expedition had been used in the delivery. Mr. Justice WILLES said the jury would determine whether the loss arose from bad stowage or from perils of the sea. If they should be of opinion that the damage did not arise from the oilcake being improperly stowed, defendant would not be liable; but they would have to consider another ground of complaint, and that was, that the cake had not been delivered within a reasonable time after the ship arrived in dock. If they should come to the conclusion that the loss had resulted from bad stowage the second question would not arise; but if they should not, then they would say whether the goods had been delivered within a reasonable time, and if not they would fix the amount of damages. The jury found a verdict for plaintiffs on the point that the cake had not been delivered within a reasonable time. Damages £15 17s. His lordship said the verdict would be for defendant on the count for bad stowage.

301. Alleged Unseaworthiness. Norfolk Circuit, Norwich, August, 1865. *WATLING v. WILLIAMS*. Plaintiff was a merchant at Great Yarmouth, and defendant master and part owner of the brigantine *George*, of Caernarvon. Mr. O'MALLEY, Q.C., stated that the question to be decided was, who should be made to bear the losses arising from that to which he was free to admit neither party was in the least to blame. On the 12th November, defendant's vessel was chartered to carry a cargo of oilcake from Marseilles to Yarmouth. When she arrived and as the cargo was being unshipped, the oilcake on the port side was found to have been considerably injured by water. Plaintiff was sent for, and he went on board with defendant and other persons, and found the oilcake in such a state that it had to be dug out. The lower part of the deck was not only saturated and marked by the oozing of the water, but the water was traced down the lower tiers, and eventually it was discovered that the damage had arisen from an oversight. The vessel was built at Prince Edward's Island, and it was well known in the trade that, speaking generally, caulking was not securely done there. Owing to this defect the water had run through a hole about an inch long, in the port side, and thus destroyed the cake, and whilst proceeding with the unloading, they found another portion of the cake in the same state, caused by the water flowing through an aperture in the starboard side. Plaintiff estimated the damage at nearly £100.

Mr. KEANE, Q.C., said that defendant denied that damage arose in any way from the defective condition of the ship. He produced the log-book, which showed that on several occasions the weather was very severe. The ship had been properly caulked. The voyage occupied between ten and eleven weeks, whilst the average time was only twenty-eight days. The jury returned a verdict for defendant.

802. Seed Cake. A cargo of cotton seed is bought by contract through a broker, on the usual terms, to be shipped at Termonde in good condition; seller answerable for loss of weight above 2 ½ cent. The cargo arrived in a very heated state, and the top and the outsides were all more or less mouldy; the loss of weight was in consequence over 2 ½ cent., viz. 2½, although the voyage was short and favourable. Bill of lading dated 12th August; arrived in port 22nd. The master states that the cargo became heated very soon. The ship was dry. Buyers have had previous cargoes, but never so heated, although the voyage had been much longer. They contend that, coupled with the short voyage, the very facts of the cargo heating and losing weight so much, are proofs that it was not shipped in good condition, and in answer to their enquiry if there was a fair claim for compensation, are told there is against the shipper of the cargo for the extra quarter per cent. The clause as to "the seller being answerable for loss of weight over 2 ½ cent." gives them a distinct claim in such a case; the ship being dry and making no water, the voyage good, &c.

Tonnage. 20 tons occupy 850 cubic feet or 1 keel; when wheat is 1s. ¾ quarter freight, oilcake is rated at 4s. 10½d. ¾ ton. The Mediterranean scale says, 4s. 10d. ¾ ton of 20 cwt. in bulk.

803. OIL CLOTHING should, if possible, never be stowed below, for fear of spontaneous combustion, which has frequently occurred where this caution has not been observed; if stowed below, underwriters are said to be free from liability. When absolutely necessary to stow in the hold, put them on top of the cargo near the hatchway. Spontaneous combustion is most to be feared when the goods are new or not properly cured. In the year 1850 a vessel from New York to Newfoundland took fire, in consequence of the spontaneous combustion of a case of oil clothing (jackets and trowsers) coated with linseed oil.

804. Spontaneous Combustion. On the 24th of January, 1858, when the steam-ship *Royal Charter*, Capt. TAYLOR, was in lat. 19° 35' N., lon. 24° 41' W., from Melbourne for Liverpool, with 500 souls on board, some of the second-class passengers perceived a slight burning smell, which a steward attributed to the effects of the sun's rays on the table oil-cloth. About 4 a.m. the next day, an alarm of fire was raised, the after hatches were immediately removed, and to the horror of all, the smoke ascended in such volumes as left no doubt of the sad reality. The captain, officers, and crew, assisted by the passengers, worked most assiduously at the pumps, &c., and the fire was providentially extinguished at 8 a.m. without accident,

excepting the necessary removal of the first officer in a state of insensibility, from the hold to the deck, where he recovered. The fire originated in the spontaneous combustion of some cases of oil-skins, or waterproof macintoshes. There was at first some doubt as to the cause, but on shifting the cargo, after throwing overboard such goods as were rendered worthless, another case was discovered perfect outside, but the contents, waterproof goods, were in an advanced stage of spontaneous combustion. On referring to his bill of lading, the captain found there were several cases of a similar brand or mark styled "merchandise," but the nature of their contents was not declared.

805. **Macintosh.** The Royal Mail steam-ship *Seine*, Capt. R. REVETT, left the island of St. Thomas, 13th August, 1865, for Southampton. At 9.30 p.m. when 30 miles off, smoke was observed coming up one of the pipes leading to the chain lockers. In the fore hold were 1,200 packages of india rubber waterproof clothing, tobacco, and cases of cigars. The hatches were battened down, holes cut in the deck, and five or six hoses played on the burning cargo, and she returned to St. Thomas, where with help from the ships *Solent*, *Eider*, *Conway*, and *Derwent*, the fire was extinguished. It is supposed to have originated through spontaneous combustion of the macintosh clothing shipped back from Havannah to Europe. The charred remnants had a strong smell of naphtha. The directors have prohibited such articles from being shipped on board their vessels.

806. **OILING THE SEA.** The utility of throwing oil on the sea for the purpose of reducing its roughness, is a subject which has often been discussed. The possibility of saving a ship from being disabled or even wrecked by such a simple contrivance, seems at first sight to be preposterous. Where the sea is dashed violently against a reef of rocks, or where there is a constant surf caused by an underground swell, such as that which rises on the West Coast of South America and other parts of the world, the use of oil to smooth the surface might be of little avail. According to facts which have been recorded, it does, however, appear reasonable to suppose that it might be useful under certain circumstances. There is a popular impression that in order to obtain so desirable a result, a large quantity of oil is necessary; this, however, is not the case, as a very small portion will spread itself over a great extent of water. This covering prevents the wind from entering under the surface, and thereby greatly reduces the roughness of the sea, and possibly the height of the waves—the crests of which are thus prevented from breaking, which is one of the principal causes of injury.

807. PLINY mentions that in his day divers used to throw oil to lessen the roughness of the sea in order that they might more readily discern objects at the bottom. The position of seals is readily known in Scotland when they are consuming oily fishes below ; and the course taken by shoals of herrings and of pilchards can also be easily observed through the smoothness over, caused possibly by the fatness of their bodies. From the same cause the sea seldom breaks round the body of a dead whale, and its track for nearly a mile can be easily distinguished by the evenness of the surface. It has been often observed that the cook's slush, or the waste from a disused oil barrel, or a little coal tar thrown overboard, has caused a rough sea to become remarkably smooth. Dr. FRANKLIN records that in Newport harbour, U.S., the sea was always smoother when there were any whaling vessels at anchor in it, through the waste of blubber and oil from them ; it should, however, be remembered that where there is a number of ships at anchor, the sea is generally less rough than it would be without them. When the bilge-water from oil-laden ships in the Ceylon trade, is pumped into the scuppers, the roughness caused by a gale subsides immediately, and knowing this, some intelligent masters, especially when near the Cape of Good Hope, always resort to the pumps of such ships, previous to heaving to in heavy weather. Indeed, when running in a gale, oil is sometimes thrown from vessels in the Newfoundland and Labrador trade, to keep the sea from breaking over them ; they can run much longer with this assistance than without it ; about 10 gallons in 24 hours has been found sufficient ; the oil spreads to windward nearly as fast as to leeward. When leakage has occurred in the topsides of a ship, or when she has lost her rudder, and it becomes necessary to lower a man into the water, a pint or even half-a-pint of oil, has made it sufficiently smooth for him to work, where otherwise it would have been impossible.

808. All these facts do not demonstrate the possibility of saving a ship from being disabled or wrecked. It is however recorded that on the 5th January, 1770, a Dutch East Indiaman was saved from wreck in a storm near the islands Paul and Amsterdam, by pouring on the sea a jar of olive oil. The author of "*Wellenlehre*" states that a Mr. RICHTER, who accompanied a Danish captain to the island of Porto Santo (being tutor to his son), was standing on the shore during a hurricane, when he saw the vessel in which he arrived, torn from her anchor and swallowed up. Suddenly in the middle of the bay, appeared a boat driving towards the shore. As she plunged the sea around seemed to be stilled—the snowy white of the foam giving

place to the appearance of calm water. The waves however advanced with redoubled energy, *but without breaking*, and tossed the boat so high on the strand, that the men were able to jump out and scamper up the beach. The rescue was due to the captain who, as the boat entered the breakers, stove in the head of a keg of oil, which, though unable to calm the waves, prevented them from breaking, and caused them to run up the strand like rollers, carrying the boat with them. In 1867 a master stated in the *New York Shipping List* that he had been at sea 28 years, and master for 10 years, and that he had saved the vessel under his command twice by "oiling the sea." He says, "When a ship is disabled and cannot get out of a storm, and the master has to take the heft of the gale—if he has oil on board, he should start two or three gallons over the side. This will make smooth water to windward, and then oil allowed to run drop by drop is all that is required; the ship is in smooth water as long as the oil is allowed to run. In 1864, in the heaviest gale of wind he ever saw, he lost all sails, and then the rudder; and knew the vessel could not have ridden the sea for an hour longer if he had not had some oil. Five gallons lasted 56 hours, and this saved the vessel, cargo, and lives. He recommends that ships of heavy tonnage should have two iron tanks of 40 gallons each, one on each side, with faucet so arranged that the oil can be started at any time; small vessels, 10 gallon tanks, and all ship's boats tanks of five gallons each, well filled, so that in case the ship founders or burns, the boats will have oil to smoothe the sea in a gale. With these tanks and a good master who knows the law of storms, and handles his ship so as to get her out of the centre of it, no more good ships will founder." [The subject of oiling the sea is one which so much concerns the interest of the mercantile marine, that it seems desirable that some public body should entertain it and endeavour to obtain some substantive information than is now on record. Could not the experiment be tried advantageously by lifeboats when rescuing the crews of vessels stranded or wrecked?]

809. On the 28th December, 1869, the ship *Lord of the Isles*, Capt. CRAIGIE, from Calcutta for London, with a general cargo, anchored in Table Bay, having put in to land Capt. and Mrs. B. M. MAXTER and fourteen of the crew of the British ship *Haverling*, which was abandoned on the 1st December, in lat. 34 S., lon. 50 E., being on fire. The vessel left Greenock with coal 25th August, and at 4 a.m., 30th November, a strong smell of paraffine was noticed; the hold was found to be filled with gas and smoke, but no fire was discernable. All the hatches were battened down, and all the ven-

tilators and holes in the cabin and fore-castle covered. Sail was shortened, and she stood northward in hopes of meeting some ship. While sail was being taken off, the carpenter bored a number of holes in the deck and filled them with plugs. They then stopped all the scuppers, and set the main, head, and fore pumps to work. Some of the hands were set to work to draw water, which as fast as possible filled the decks, thus allowing the water to run below on the cargo. After this, endeavours were made to throw coal overboard from the main hatch, to enable them to scuttle the 'tween decks, but the smoke and gas were so dense that they were unable to do so. Orders were then given, and the hatches were again battened down, and the crew were set to work to pump water on the decks again. At dark the weather looked squally, and the holes in the deck were plugged to give the crew a chance of getting rest. Throughout the night the smoke and gas increased, and on the 1st December, at half-past two a.m., an explosion blew up the six hatches, as also the plugs from the decks. Shortly after, flames issued from the fore and main hatches. Smoke was also issuing from other parts of the ship. The hatches, without any delay, were again battened down securely. The pumps were sounded, when it was found that there were three feet of water in the hold, but no attempt was made to get it out, in the hope that it might quench the fire. At daylight two boats were hoisted over the side, and were supplied with water and provisions for any emergency. Great difficulty was experienced in getting the biscuit out of the cabin, the smoke and gas being so dense. At six a.m. the ship was hove to to prepare the boats for the embarkation. Afterwards they were dropped astern, and the vessel headed away to the northward again. At ten a.m. the gas and smoke had greatly increased, and the ship was hove to again to enable the last boat to be got out of the davits with the captain's wife in her. The crew were then passed over the stern into the boats—the chief mate and eight hands taking to the lifeboat, the second mate and seven in the pinnace, and the captain, his wife, and three men in the jolly boat. At six p.m. the vessel blew up with a loud noise, dense smoke pouring from all parts of the hull, and she rolled and dipped her stern in the water. There being no chance of saving her, and there being danger in remaining too close, the bow rope was cut and the ship left them astern. The three boats, made fast to each other, then stood away to the northward; the object of the captain being to get in the track of homeward bound vessels, failing which he hoped to reach Madagascar, about 650 miles distant. All three boats were under sail, and fortunately were well found with gear. They were fastened

together, and though the night was squally, they rode it out in company. On Thursday the pinnacle broke adrift, and the crew in her thought they could do better alone, and refused to be fastened to the other boats again. No anxiety was felt for her, as she was the best sailing boat of the three. On Friday the wind blew very hard, and at two o'clock on the morning of that day the pinnacle was seen for the last time. There was now a very heavy swell breaking round the two boats, and but for the curtain of canvas which the captain with great forethought had placed some two feet above the gunwale of the boats, they must have been swamped. At the stern of the boat some planks had been placed across the thwarts, and on these, on a mattress covered over with canvas, was Mrs. MAXTER; sometimes the jolly boat was so filled with water, that that lady was covered with it. Oil was thrown overboard to prevent the sea from breaking on the boats, and it is to the wise precautions of the captain that those who were saved attribute their not having gone down in the gale. Throughout the whole of Saturday, and up till Sunday afternoon, the gale raged. At four p.m. on Sunday the wind decreased so as to enable them to set sail. On Monday the weather was fine, and they were able to dry their bread and their clothes. On Tuesday and Wednesday it was intensely hot; and what with the heat and the salt water with which they were drenched, they all suffered much pain. Indeed, it is surprising that the captain's wife survived; but she, it is said, held out as pluckily as the rest, and the calmness of the captain in all the difficulties and dangers gave courage to those around him. The boat was well supplied with preserved meats and bread; but in distributing the water, the captain, not wishing to take to his share anything more than the rest, gave each of the other boats a cask, and took into his boat some water in demijohns. It afterwards turned out that some of the demijohns had previously been filled with oil, and the others with vinegar, and it was only excessive thirst that could have made them drink the water at all. On Thursday evening, at eight o'clock, they were all safe on board the *Lord of the Isles*; but they were taken up with some difficulty, for their limbs had become so cramped with continual sitting, and being covered with water, as to become almost useless, and the captain's lady especially was much exhausted. The *Havering* was a full-rigged ship, 845 tons register, and belonged to Mr. R. HILL, of Plymouth. She had on board between 1,100 and 1,200 tons of coal, with which she was bound to Bombay. Strange to say, it is only a few days ago the news received from St. Helena, to the effect that the captain and crew of

the ship *Orixa* had been landed there, the vessel having been burnt at sea. The *Orixa* and the *Havering* were loaded alongside of each other, the coal being taken from the same mine. The pinnace which broke away was a good sea boat and well supplied with provisions. She had on board the second officer, a white man, and seven black sailors.

810. The Bombay government, in 1869, appointed a commission to enquire into the losses by spontaneous combustion of ships bound to that port. The commissioners, in March, published their report, which is contained in 19 sections. Of these, section 14 says—In view of the adoption of such measures, we offer for the consideration of the government and others interested, the following suggestions. 15—In case of all ships laden with coal, a cylinder of iron three inches in diameter, perforated its whole length, and reaching down to the bottom of the cargo, should be placed in the centre of each hatchway, a rod of wood to fit easy being introduced to prevent the coal-dust filling it through the holes while loading. When the loading is completed the wooden rod should be replaced with an inch iron one of the same length. At short intervals of time these should be carefully examined. To render such examination easy, an eye should be formed at the head of the iron rod, to which can be attached a whip from aloft, and the rods drawn and examined in a few minutes. Even while in the act of withdrawing, the hand can examine them, and, having done so to within a foot of the end, they can be again lowered. 16—Should the rod be considered not sufficiently sensitive to detect, through the cylinder, a slight increase of heat, a thermometer, lowered by a line, could be used, and it should also be used occasionally to ascertain the mean heat. Any great increase would give the necessary warning. 17—In the event of fire the hose of the pumps can be introduced into the cylinders, and water thrown to the bottom of the cargo, and disseminated by means of the holes to all parts of it.

811. OLIBANUM, a gum resin, the produce of a large Arabian and Indian tree, usually shipped in chests or cases; that from the Levant is generally preferred. E. I. Co.'s ton 18 cwt.

812. OPIUM, Bengal and Malwa, is packed in tinned chests of 140 lbs. net each, and being very valuable in proportion to its weight and measurement, freight is usually charged at per chest; specific gravity 1.336. The 100,000 chests annually exported from the East Indies (chiefly Calcutta) to Malacca and China, used to be carried in clippers built expressly, and taking 700 to 1,600 chests

each; they took nothing else except saltpetre as ballast: steamers now carry nearly all. In measurement about five chests go to a ton, and being very carefully and securely packed, it is not liable to be much affected by contiguity to other articles. It is shipped all the year round, chiefly in January, February, and March.

813. **Sea Damage.** In the case of *TRONSON v. DENT*, where a ship, from injuries received at sea, was obliged to put into Singapore, and the cargo was found partially damaged by sea water, and the master, who acted *bona fide* and to the best of his judgment, selected some damaged chests of opium, and sold them by auction, the owners of the ship were found liable to the consignees of the cargo for the loss which arose; because the captain might have had the damaged opium dried and re-packed whilst the vessel was being repaired, and have delivered it, though in a damaged condition, with the other opium. And it was held that it was the master's duty to have carried the cargo to its destination, although in a damaged state. This decision seems severe.—*Hopkins on Average*

Tonnage, &c. Bengal and Bombay tonnage at per chest. Two maunds of East Indian opium contain 149½ lbs.; chest 141½ lbs.; tare for leaf and dust 1½ lbs. Turkish tefcee or taffe 250 drachms, chest 136 lbs. Smyrna chequee 158 lbs.

814. **ORCHILLA**, a name for various lichens producing a rich purple dye, is imported from the Canary and Cape de Verde Islands, Angola, Lima, &c.; see ores. Orchilla is not considered to be injured by very dry weather, but rainy weather will deteriorate it.

815. At **Payta**, in North Peru, the weed is made up in compressed bales 4½ feet long, weighing 90 lbs. gross; they are packed in coarse loose sacking, or "bagawrinkle" fastened with six bands of rope, weighing in all 7 lbs., and are brought to the ship, two cables' lengths from the shore, in large catamarans, each holding from 200 to 400 bales. In August, 1862, the *Ravenscraft* stowed there 2,300 bales (225 tons freight, 92½ tons weight) in her 'tween decks, with 600 tons nitrate of soda in the main hold, and then drew 19 feet aft, and 19½ feet forward; see linseed. The orchilla was injured by the "steam" from the nitrate. In Peru it is customary to pay orchilla £5 10s. per ton, as light freight, when saltpetre receives £3 10s.

816. In May, 1864, the three-masted schooner *Enfield*, loaded at **Zanzibar**, taking a considerable number of bales of orchilla weed. They were irregular in size and shape, matted and iron banded—weighing about 4 cwt.; screw pressed by hand, excepting two sample bales, turned out of the first and only hydraulic press on the island, and which was specially intended for cotton. These bales were only about 14 feet measurement, and weighed about 350 lbs. The schooner had a full cargo consisting of about 22 tons Nos Beh or Nossi Bé (a French settlement on the North West coast

of Madagascar) sugar, a large quantity of black and white sesame or gingelly seed, bees' wax, purified and melted into beer hogsheads, bales of orchilla weed, bags of cloves, chillies, and ground nuts, and about six tons loose ivory tusks. She had no ballast, drew ten feet aft, nine feet eight inches forward, and was in good sailing trim. She was 170 tons register, and took from England 304 tons weight and measurement goods.

ZANZIBAR CURRENCY.

	£	s.	d.	=	₹	c.
G Sovereign	1	0	0	=	4	87
Napoleon, 20 francs	0	16	0	„	3	75
10 Franc piece	0	8	0	„	1	87½
5 Franc piece.....	0	4	0	„	0	93¾
S Maria Theresa, or Black Dollar...	0	4	3	„	1	00
Mexican, or American Dollar.....	0	4	0	„	0	94
¼ Dollar	0	2	0	„	0	47
5 Franc piece.....	0	4	0	„	0	94
2 ditto.....	0	1	7½	„	0	38
1 ditto	0	0	9¾	„	0	19
Rupee and English Florin	0	2	0	„	0	47

Bombay quarter annas—8 instead of 16 being calculated to the rupee and 16 to the dollar, each anna however contains 8 quarter annas; this anomaly is difficult to be understood.

817. The ship *Naval Brigade*, 541 tons, Capt. MOON, of Plymouth, loaded orchilla, cloves, &c., at Zanzibar Island, in January, 1865. The orchilla was brought from the main in loose bundles and packed on the island by hydraulic pressure, into bales of 700 to 1,000 lbs. each, matted and secured by iron bands, and measuring on an average about 30 cubic feet. 50 cubic feet go to the ton for freight, and the bales are considered eligible for stowing. The cloves were in bags containing 1¼ cwt. each net; 10 cwt. to the ton freight. She had 220 tons of orchilla, 600 tons of cloves, 20 tons of Chili pepper in bags of 120 lbs. (10 cwt. to the ton) 20 tons of ivory tusks loose, and 120 tons of ballast. The ship then drew aft 16, forward 15 feet; with a dead-weight cargo of 800 tons, her draught is aft 17½ feet, forward 16½ feet. She is 141 feet long, 29½ broad, 19 deep, and has a height of 'tween decks of 7½ feet. The **port charges** at the island of Zanzibar are *nil*, and the pilotage nominal. In 1865, the island was governed by SAID MEDJID (brother to the Imaum of Muscat), who, for the improvement of navigation, laid down several buoys, two of which (white) are placed nearly north and south, on the eastern extremity of the sand-pit extending from French island (Champany) towards the main of Zanzibar. When coming from the north, the proper passage for ships is to the eastward of these

buoys. Coming from the south, after passing Choomby island, the proper passage is to the eastward of two buoys, nearly north and south, on the eastern extremity of the South Larkbry sand. Very good water can be obtained about four miles north of the town of Shangany or Zanzibar; it must, however, be taken at nearly low tide. The natives gather it at the spring in beakers (provided by the ship) and empt them into the ship's casks in the boat which is moored afloat off the beach. The mate or a trustworthy officer ought to superintend.

818. ORES. On 16th April, 1858, Mr. T. COURT, Secretary to the Liverpool Underwriters' Association, says:

"The custom appears to have prevailed for many years in the ports on the West Coast of South America, of stowing wood, orchilla, and other light goods, at the side of a vessel, for the purpose of forming a trunk for copper ore, nitrate of soda, &c., on the ground that the vessel is much easier than under the ordinary method of stowing the heavy freight below, and the light above.

"It is found, however, that vessels from Chili and Peru, generally deliver their wool cargoes more or less damaged, owing to their loading very deep, the damage varying according to the quality of the ores, some of which being damp, and of a heating nature, render wool very susceptible of injury, while others though dry and cool cause injury by their dust.

"In nitrate also there is a great difference in the quality, some descriptions being perfectly dry, from which wool is not susceptible of damage, and others very damp, which frequently cause injury by draining.

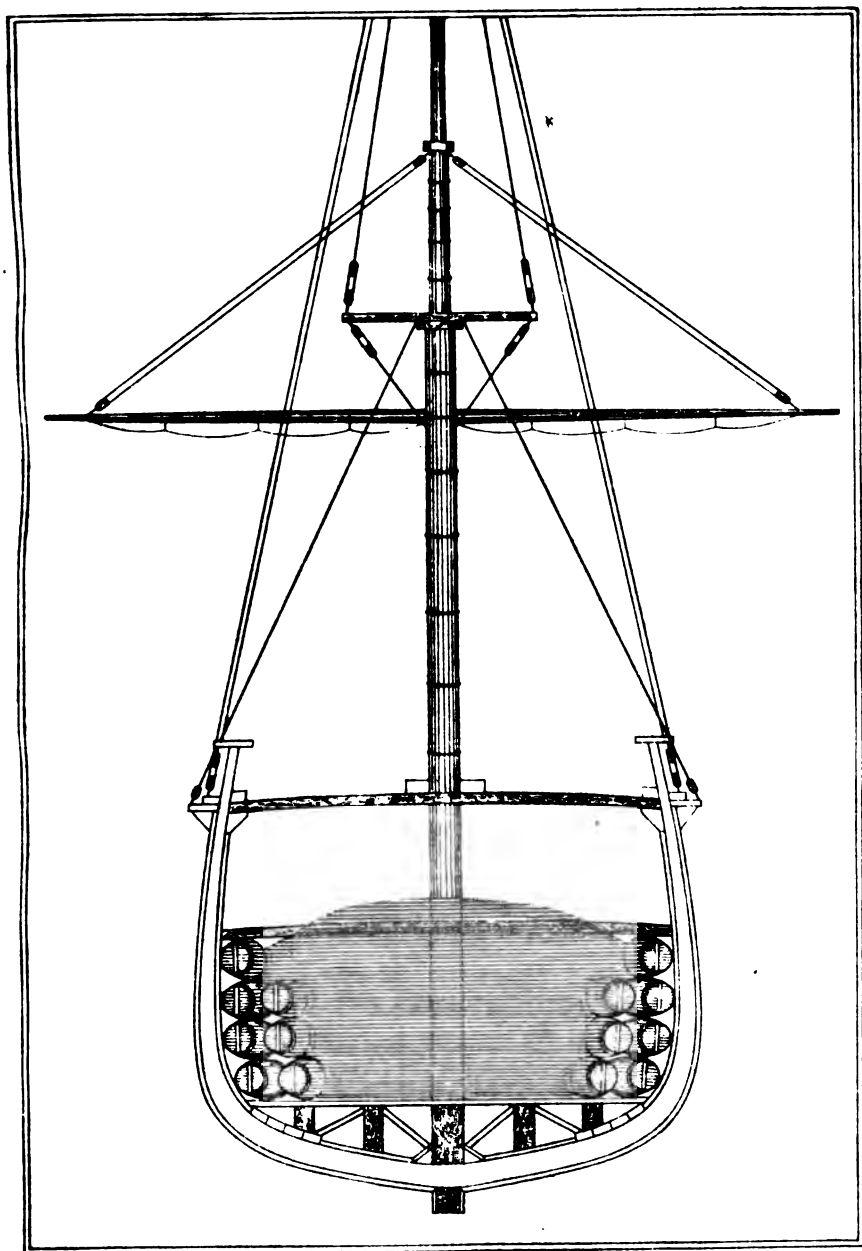
"Bone ash is an article that creates considerable heat and steam when it gets wet, and in one vessel recently arrived here from Rio Grande, several bales of hair were damaged from that cause."

Two paragraphs in this letter relating to spirits of turpentine, naphtha, and vitriol, are transferred to those articles.

Tonnage, &c. In South Wales 21 cwt. reckon as a ton. Cornwall 21 cwt. or 2,352 lbs. At New York 20 cwt. copper ore. In Pennsylvania a ton of iron ore is 2,240 lbs., sometimes 2,480 lbs. A Spanish caxo of ore contains many quintals; at Potosi, 5,000 lbs. A Surat maund 41·6 lbs.

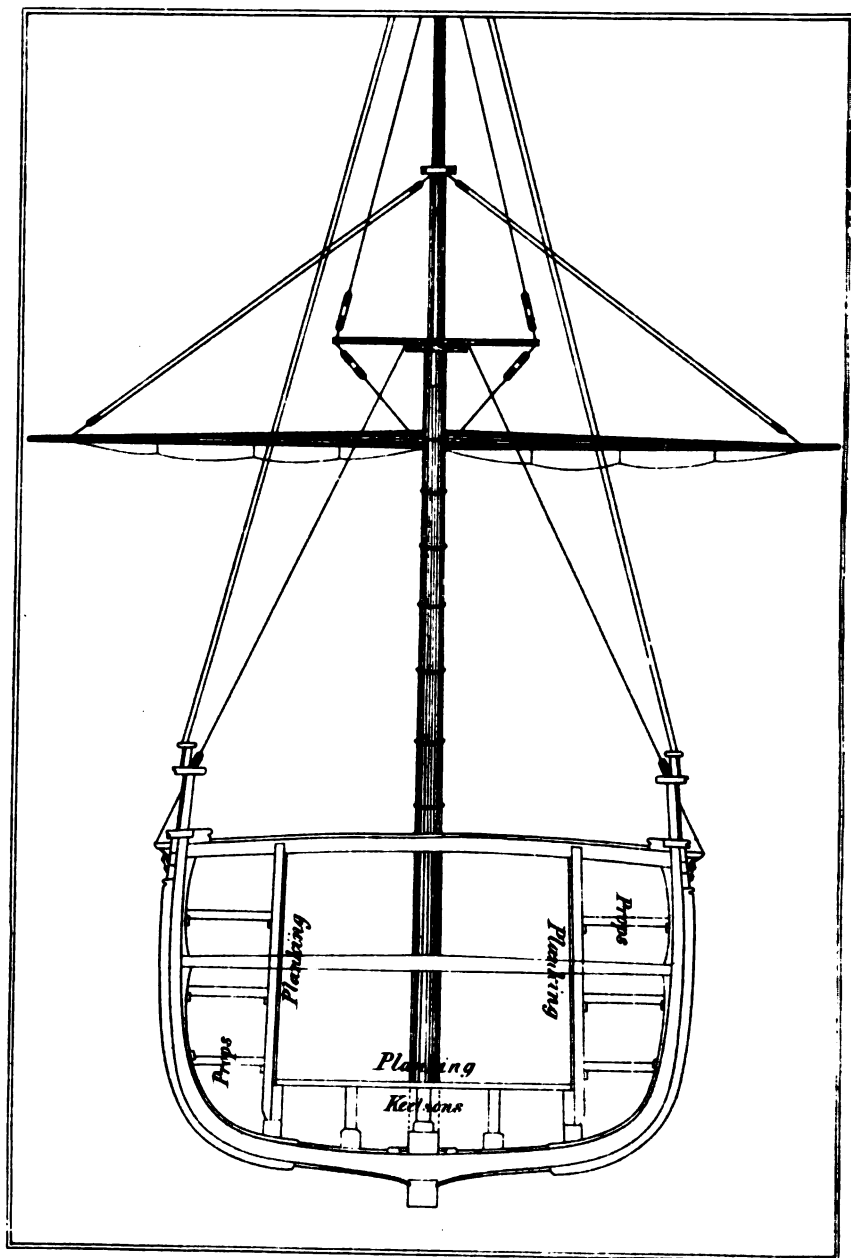
819. A wharfinger recommends the ores of copper, iron, or lead, to be conveyed in vessels having a platform built in the hold at about one-fourth of her depth from the bottom; this would make the ship lively in a sea-way, and less liable to strain and carry away spars. In shipping for short voyages, it has been a common practice to load

STEVENS ON STOWAGE.



COPPER ORE SHIP.

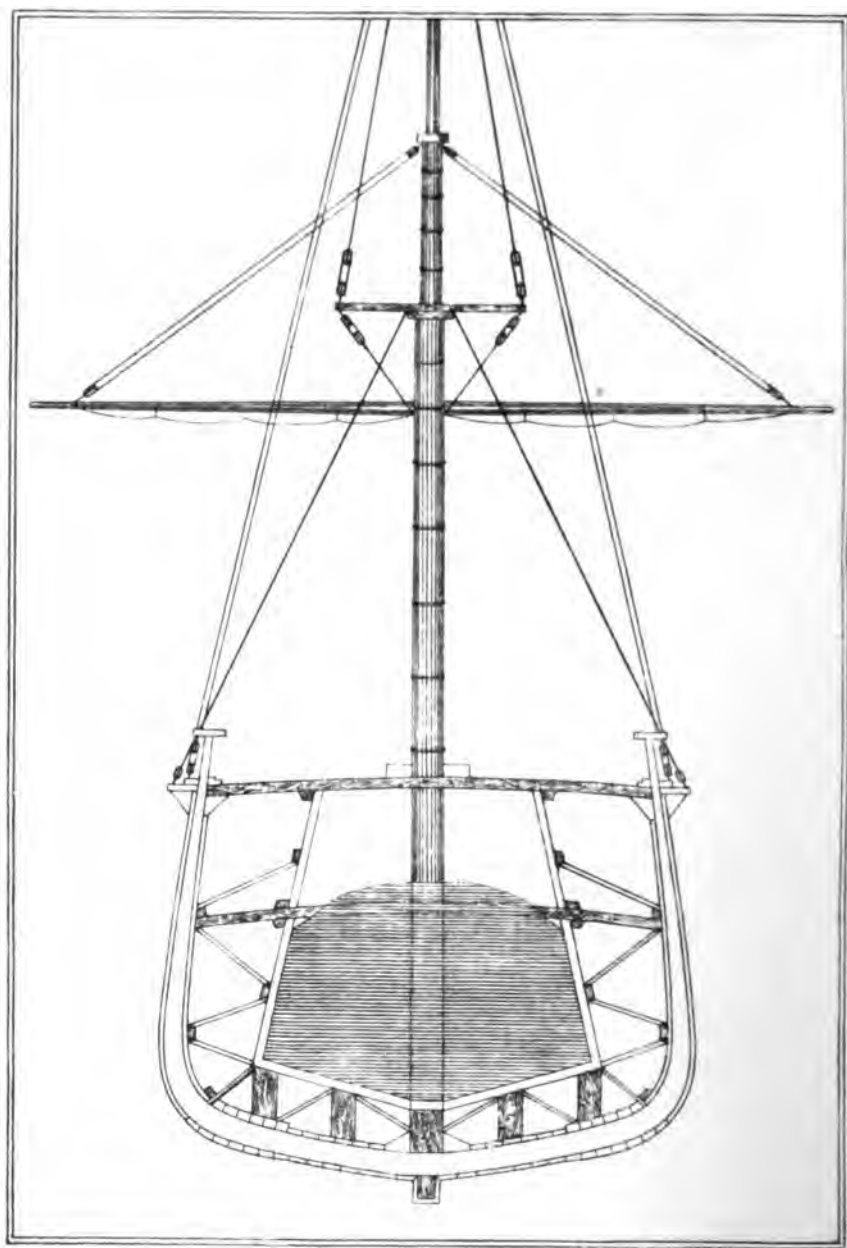
STEVENS ON STOWAGE.



TRUNK SHIP,

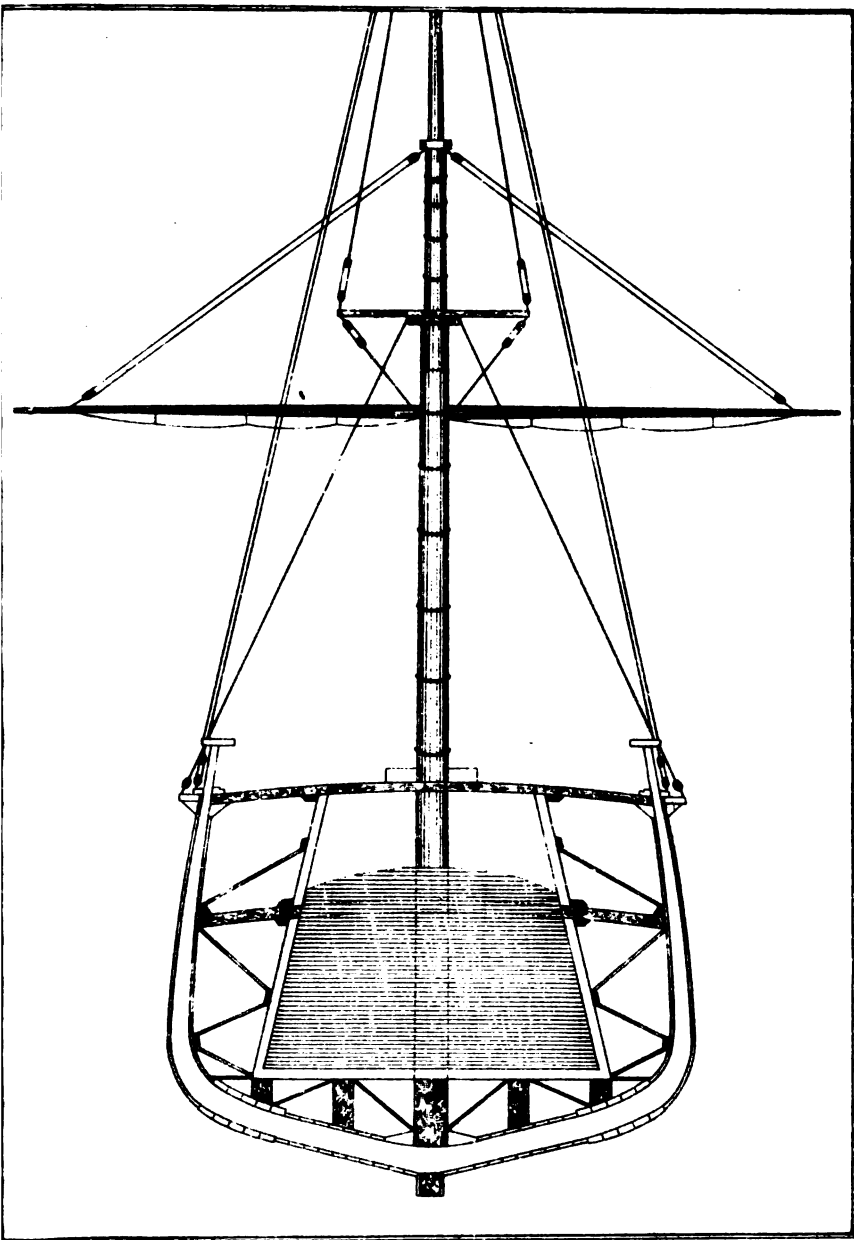
With horizontal platform. and perpendicular sides.

STEVENS ON STOWAGE.



TRUNK SHIP,
With sloping platform, and inclined sides.

STEVENS ON STOWAGE.



TRUNK SHIP.

With horizontal platform, and inclined sides.

ores through the main hatch without trimming, and small coasting craft of all ages, and of various classes, have gone wonderfully safe, but long vessels should either load partly through the fore and after hatches, or trim the ore fore and aft, to equalize the strain. For want of this precaution, some new vessels fall in the waist several inches, when afloat. A proportion of light cargo underneath ore may be found advantageous. The specific gravity of yellow ore is 4·160; of red, 5·8 to 6·000; Derbyshire lead ore, 6·565 to 7·786; Coalbrook Dale iron ore, 3·527.

820. At **Swansea**, ships of 600 tons register, intended for Valparaiso, are prepared with two bilge keelsons each side the main keelson, on which a trunk is fitted for the reception of the ore; the platform is blocked off, say two feet from the ceiling; it runs fore and aft from bulkhead to bulkhead; the sides fall in, say three to four feet in all, when they reach the deck. A ship will not conveniently carry more of this ore than will fill one-third of the cubical contents of her hold. A Swansea firm adds—all vessels regularly engaged in the foreign copper ore trade, have the main keelson raised to the height of about four feet above the skin, on which is laid the platform, which should run as far as possible fore and aft, as many cases have occurred of vessels straining in consequence of the shortness of the platform, and the weight falling too much on one part. The trunk prevents the cargo from pressing against the sides, and generally slopes inwards about three feet. At the top it may be about one-third the breadth of the vessel. Some very narrow vessels dispense altogether with the trunk, and use a platform only; in which case the bilge keelsons are raised considerably higher than the main keelson, so that both sides slope down towards the centre. [In the drawing, the struts at the sides represent the shores against the bulkheads or trunk, which runs in a continuous line fore and aft with longitudinal cleats on the uprights to receive the shores.]

821. An experienced master says—he loaded a ship with 500 tons of copper ore at **Valparaiso**; the ore was first laid level with the keelson, then a number of strong puncheons, 300 to 400 gallons each, purchased from a condemned whaler, were placed on their sides across the same; the ore was filled in upon them, and allowed to fall between. By this mode he avoided the necessity of constructing wings, which, in heavy weather, or in going a long time on one tack, are likely to be broken through. One of the barrels was full of flour, and so evenly was the pressure borne, that after discharging, the barrel was found uninjured. It cannot, however, be concealed that this master incurred some risk, which would have been greatly

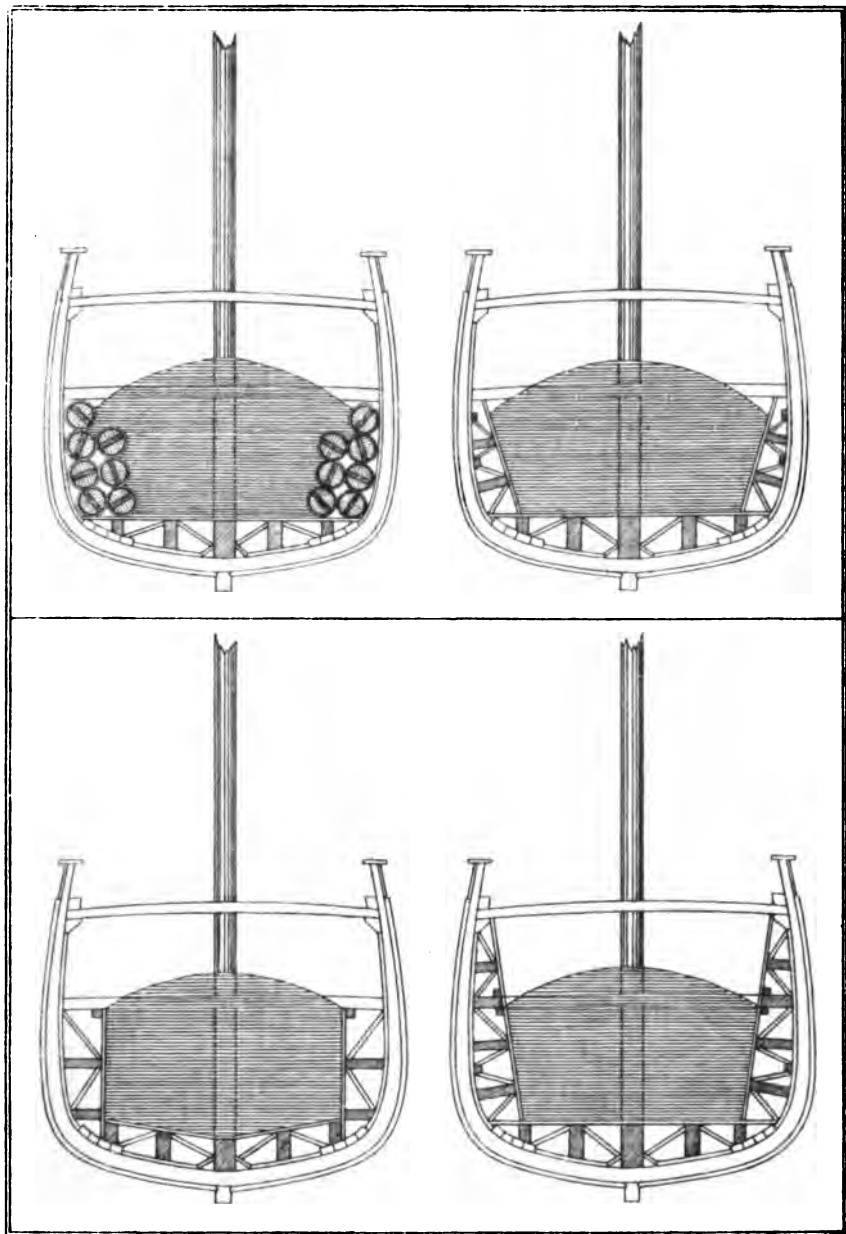
increased had any of the casks bursted, when the cargo must have run to the wings, and put the ship out of trim. It constantly happens that ships not fitted with platforms or trunks, are compelled to put into intermediate ports leaky.

822. Copper ores from **Ohili**, which exports largely, and from Bolivian ports are always shipped in bulk. Shipments are made all the year round. When loading Peruvian or Bolivian copper ore in trunks, an experienced master recommends that it should be run up in three pyramids towards the fore, main, and after hatchways, keeping, (of course) the greatest weight in the centre of the ship. Silver ore hence is packed in canvas bags containing about 50 lbs. each. The barque *Cubana*, 492 tons register, Capt. ANDREW PEARRE, left Caldera, 27th May, 1862, and on the 20th June the mate came out of the cabin and the carpenter from the half-deck, and said the ship was on fire. She had a cargo of copper ore for Swansea, and was entirely consumed. After great privations the crew reached Falkland, where the second mate and one seaman died through cold and exhaustion. Bar copper is sometimes shipped at Coquimbo, and silver ore at Caldera de Copapo.

823. Copper ores from **Sydney** are generally in bags, which must be kept dry and not placed near the iron hoops of casks of oil or tallow; see the article magnetism. **New Zealand** ore, which is a combination of sulphurates of iron and copper, is subject to spontaneous combustion, and several serious accidents have thereby occurred. South Australian ore being carbonate and oxide of copper, has not that dangerous property. It is stated that when sulphur is mixed with ore and it becomes wet and heated, contact with light wood or other easily ignitable substances, will produce combustion. At Adelaide, copper ore is shipped in bulk as well as in bags, at a low freight for ballast, to receive wool. Copper ore at the Moonta Mine, Adelaide, is estimated at 21 cwt. to the ton. Adelaide copper ore contains about 25 $\frac{1}{2}$ cent. of pure copper, and is shipped all the year round: it is made up in bags of various quantities, from 1 to 3 $\frac{1}{2}$ cwt.; the bags containing 1 cwt. weigh 1 $\frac{1}{2}$ lbs. Each ton of Adelaide silver-lead ore contains from 50 to 60 $\frac{1}{2}$ cent. of lead and 30 to 50 oz. of silver. It is shipped all the year round, is packed in bags containing each 1 cwt., the bags weighing 1 $\frac{1}{2}$ lbs. to 2 lbs. each. It is also packed in sample boxes 18 inches long, 10 broad, and 10 deep.

824. **Pomeran**. The brig *Mary Elizabeth*, Capt. JONES, which belongs to Mr. N. HEWERTSON, Newport, is fitted with a moveable trunk for use when carrying ores. She registers 187 tons, is 101.8

STEVENS ON STOWAGE.



COPPER ORE SHIPS.

feet long, 21·8 broad, and 13·7 deep. The trunk consists of two bulkheads 33 feet long and 10 feet apart, rising perpendicularly from the bilges to the deck. So fitted she takes in 340 tons of Pomeran copper, which fills the trunk up to the hatchways; she then draws 13 feet 7 inches aft, and 12 feet 7 inches forward, and being rather narrow, is more lively at sea than when laden with 330 tons Scotch coal, which makes her draw 13 feet 5 inches aft and 12 feet 6 inches forward.

825. Copper ore lies heavier than a stowed or loose cargo of bar iron, and will therefore test the strength of the ship to a greater extent. When ships laden with copper ore have the scarphs of their keels fitted sideways, they are very liable to leak. In one instance the owner of a vessel in a western port, which was laden with ore, had to pay over £300 in consequence of such leakage. Side scarphs are stronger than flat scarphs, but they are more liable to leak with heavy cargoes stowed in bulk like copper ore, &c. Stopwaters (small pieces of fir like treenails), cannot be introduced into them. Flat scarphs when strengthened by the help of extra-sized keelsons, are generally considered stronger than side scarphs.

826. **Spontaneous Combustion.** In the Court of Exchequer, 21st December, 1852, *Thomas Bell*; *RICHARDSON v. SADLER*, it was decided that where spontaneous combustion has been caused by the ore not being calcined before shipment, the charterer was liable to the shipowner for consequent loss of freight.

827. **Sister keelsons.** A ship prepared for the copper ore trade, was chartered to load coal outward, and copper, copper ore, silver ore, and other "lawful merchandise," homeward. Of ores she discharged 707 tons, and was then chartered on a similar form. Homeward she loads guano and turns out only 661 tons, owing to the space occupied by the sister keelsons and trunk fixtures. As the master did not protest against loading guano, the owner lost the freight of 46 tons.

828. A master writes to the *Shipping Gazette*, 11th May, 1860. Has the consignee of a cargo of iron ore from Whitehaven, a right to deduct freight for several tons weight of cargo for damp contained in the ore which is always shipped more or less in a wet state, while the ship has to carry all the wet contained as well as the ore, and is rendered as deep in the water by one as the other? A tub containing 2 cwt. of the smallest ore and the greatest quantity of wet, was weighed wet, then placed in the sun and wind, and turned over until dry, and afterwards weighed; by the result, the cargo is calculated for freight. The Editor answers: the state of the cargo when ship-

ped and delivered is a question of evidence. The mode of weighing described is so manifestly unfair that the master would be justified in refusing to be bound by it.

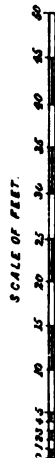
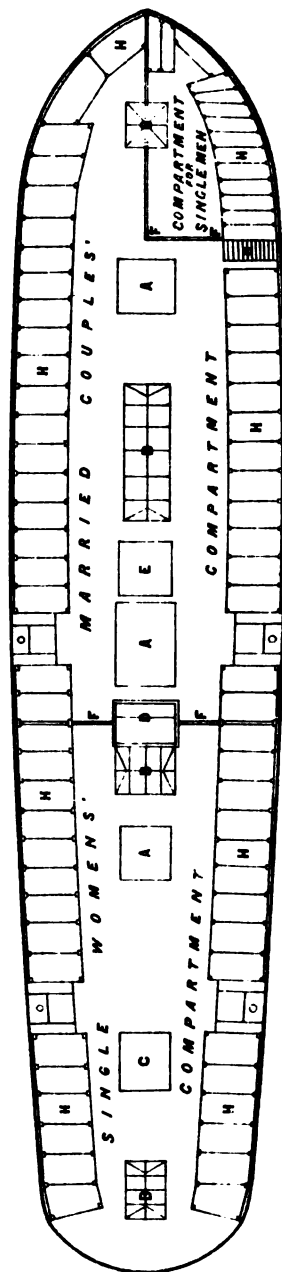
829. ORPIMENT, a mineral composed of sulphur and arsenic, produced chiefly in Turkey.

830. PADDY, rice in the husk ; see rice. Bengal and Madras ton 15 cwt., Bombay 16 cwt.

831. PAINTS are packed in tins, kegs, or casks, 14 lbs. to 10 cwt. each ; see leads. The importance of carrying to sea *mixed* paints for painting the boats, bulwarks, spars, topsides, &c., instead of requiring the carpenter's store room to be fitted up with tanks for oil and spirits of turpentine, &c., was fearfully exemplified by the burning of the Spanish Admiral's flagship at the Chincha Islands, and of the fine merchant ship *Carabou*, from Liverpool to India : both casualties were occasioned by incautiously drawing off spirits of turpentine for mixing paint. Paints, oils, turpentine, &c., for ship's use, should be stowed in a store-room on deck.

832. PARTICULAR AVERAGE refers to a loss which falls on any particular interest concerned in the ship, her cargo, or freight, and is used to distinguish it from general average, which involves a loss on all those interests combined (see general average). The customs and laws affecting average are based on the presumption that insurance has been affected, and in case of non-insurance the interested party stands in the position which the underwriters would otherwise occupy. In case of loss by the perils of the sea, so numerous have been the frauds practised upon underwriters that customs of a very complicated nature, which have received the sanction of the law, have arisen, for guiding the adjustment of the loss amongst the various interests involved. The average proportion of loss is taken at per cent. on the value of the interests, and is proportioned—consideration being given to the circumstances of the case—according to well-known rules, by means of an average statement, which is drawn by professional average staters, skilled in that profession. Certain losses are by custom and law general, whilst certain other losses are particular. A general average loss is according to its amount, divided between all the interests involved in proportion to their relative value. A particular average loss is thrown on the particular interest involved. A general average loss would be thrown on the ship, cargo, and freight. A particular average would be thrown on the ship, or the cargo, not both, as the case might be. In case of loss masters are bound to be very correct with respect to

SIDE PLAN OF FITTING.



A. Hatchways
 B. Saddleback Slight Ventilators.
 C. Ventilator and Gangway
 for Single Women on to the Poop.

D. Cabin for Married Matron
 with entrance from Married compartment.
 E. Store Room
 F. Lower-Work Bulk-heads

When there is a large number of
 Single Men the line F.F. in their com-
 partment is to be extended across the Ship
 G. Gangway to Deck Water Closet
 H. Berths.

the statements made in their protests (see protests) in the information given to the surveyors of ship or cargo, and in the statement of accounts of disbursements on ship and cargo, in case of repair of damage. A mis-statement is nothing short of a fraud.

833. **PASSAGES.** Viâ Suez Canal—Liverpool to Bombay.—Compiled by one of the officials connected with the Liverpool Chamber of Commerce.

<i>Sailing Vessels.</i>	DAYS	<i>Steam Vessels.</i>	DAYS
Viâ Cape of Good Hope	95	Viâ Cape of Good Hope	60
„ Overland route.....	43	„ Overland route.....	43
„ Suez Canal	38	„ Suez Canal	38
To the United States.....	40	To the United States.....	12

PASSAGES FROM VARIOUS PORTS TO St. HELENA
in the year 1869.

	DAYS		DAYS
Algoa Bay	20	Kurrachee	82
Akyab	89	Manilla	96
Australia	79	Madras	70
Ascension.....	5	Mauritius	38
Batavia and Java	65	Mozambique	48
Bourbon	32	Moulmein	86
Bombay	72	Madeira (steamers).....	17
Bussorah	79	Penang	75
Bassein	84	Pondicherry	70
Cape of Good Hope	11	Port Natal	23
Calcutta	78	Port Alfred	21
Ceylon	66	Rangoon	90
China	90	Singapore.....	72
Coast of Africa (West)	10	Sumatra	62
England (steamers)	24	Siam	92
Do. (sailing vessels)	70	Simons Bay	14
Gibraltar (steamers)	20	United States	79
Japan	96	Valparaiso	54

[The voyage commences from the time the ship “breaks ground”—that is, from the time she leaves the docks for sea.]

834. **PASSENGER SHIPS** should be so stowed that the consumption of water, fuel, and provisions will lighten them bodily, and thus keep them in trim. The lower hatches should be well secured to keep out damp and filth. It is the practice in some ships to place sheep, pigs, and poultry in the long boat, which is fitted with a temporary platform under the thwarts for this purpose; in a short time, for want of care, or of convenience, the butcher, who usually has charge, allows an accumulation of offensive soil under the plat-

form, which unfits the boat for human occupation, and rots the ribs. There is often stowed round her a lot of heavy spars, so cumbersome that it would be nearly impossible to remove them in time of danger, which is almost the only time when the long boat is wanted. Such arrangements are not permitted by government officers; they are in direct contravention of clause 292 Merchant Shipping Act, which requires, in proportion to the crew and passengers, a certain number of boats, including two lifeboats, "at all times fit and ready for use." For water and provisions see the articles.

835. Passenger ships or steamers have to be surveyed under the Merchant Shipping or Emigration Act. The owner may appeal against such survey. See section 14 Merchant Shipping Act 1876. Any vessel surveyed under the Merchant Shipping Act 1854, shall not require to be again surveyed if she becomes a passenger ship. See sec. 18, Act 1876.

836. **Troop Ships for India.** It is unusual to embark troops in any ship which has had guano on board on her *last voyage*. This condition is sometimes extended to the necessity of making two voyages after a guano cargo. **Troop Ships from India.** 10½ feet (super.) of deck are required for each soldier, and 17½ for each invalid. It is usually calculated that 100 to 110 cubic feet is necessary for each man. For sailing purposes, troops are considered as light freight, and are so far desirable. For the Admiralty regulations regarding the conveyance of troops, see the article troops. Invalided seamen belonging to the Royal Navy, may, by Queen's Regulations, 1862, be sent home from abroad, in merchant ships, at a cost not exceeding 2s. per diem, except in special cases.

837. **United States.** No vessel is to carry on the lower deck more than one passenger for every 14 clear superficial feet; nor in any case more than two passengers for every five tons of the ship's burthen. Each child, however young, counts as a passenger. The penalties for infringing this regulation are: for each passenger in excess a fine of \$50 on the master, who may be also imprisoned for any term not exceeding a year; and if the number of passengers in excess amount to 20 in the whole, the vessel is liable to be forfeited. This regulation was wonderfully abused during the excessive immigration of Chinese into California from China in the years 1850, 51, 52. The United States Consuls' certificates granted in Canton or Hong Kong with respect to the measurement and number of passengers allowed to be carried, was entirely put on one side as being of no force although a fee of \$16 was paid previous to starting. Many ships which had left China with a few under the prescribed

number, and had also lost a great many by death, were re-measured at San Francisco, and charged with carrying 30 or 40 more, confiscated, and sold by auction. There was no appeal, the British Consul was powerless, and there was no British ship of war in the port to protect mercantile interests. If the vessel has more than two tiers of berths, or the interval between the lower berth and deck be less than six inches, or the berth be not well constructed, or their dimensions be less than six feet in length and eighteen inches in width for each passenger, the master and owners are severally liable to a penalty of \$5 for each passenger on board. The penalties are declared to be liens on the ship, which may be sold for payment. The average weight of a man is taken as 150lbs. and of a horse 1,000 lbs.

838. **Sea Sickness.** To prevent it Dr. LANDERER, of Athens, recommends 10 to 12 drops of chloroform in water. The chloroform, in most cases, removes nausea, and persons who have taken the remedy soon become able to stand and get accustomed to the movement of the vessel. Should the sickness return, a fresh dose is to be taken. It was tried on 20 passengers, on a very rough voyage from Zea to Athens, and all, with the exception of two, were cured by one dose. The minority (two ladies) were able to resist the feeling of illness on taking a second dose.

839. **Cargo—Life Salvage.** Judicial Committee of the Privy Council, 8th March, 1865. Present Lord CHELMSFORD, Lord Justice KNIGHT BRUCE, and Lord Justice TURNER. This was an appeal instituted by the owners of cargo on board the *Fusilier* against the decree of the judge of the Court of Admiralty, whereby they were held liable to contribute to the remuneration awarded to certain salvors for saving the lives of the passengers on board that vessel in December, 1863. That decree was made in a suit in which the salvors were plaintiffs. The case, which involves a question of great importance, was reported in *The Times* of 16th June, 1865. On the hearing of the appeal during the last sittings of the Judicial Committee of the Privy Council, Lord CHELMSFORD delivered judgment, holding that the owners of cargo are liable to contribute to life salvage remuneration, and consequently affirming the decision of the judge of the Court of Admiralty. Appeal dismissed.

840. **Insufficient Accommodation.** Court of Exchequer, 18th February, 1865; before Mr. Baron MARTIN. FRAMPTON v. RENNIE. Plaintiff had emigrated to Natal, but his wife's health failing he determined to return, and engaged a cabin in the *Natal Star*. All the saloon berths were engaged, but the agents undertook to fit up a berth, for which £73 10s. was paid. Plaintiff complained that two of his boxes were put in the hold where their contents were negligently destroyed by sea-water; his cabin contained only one bunk; the water ran through on the blankets, which they were obliged to wring on deck and hang on the rigging to dry. No wash-stand being provided he and his wife were obliged to take it in turns to hold the wash-basin to each other; plaintiff had to clean his boots and empty the slops. The provisions were indifferent; there was no arrowroot or milk for the child. The dampness caused Mrs. FRAMPTON to have

an attack of rheumatism. Defendant stated that the case was exaggerated; the damage to the boxes was caused by rain-water before reception; the cargo of wool and hides were delivered dry. Several passengers said the provisions were good. Damages for plaintiff £77 18s.

841. **Imprisonment.** Second Civil Court, 6th August, 1866, before Baron CHANNEL. ALDWORTH, who had resided 13 years in Australia, took first-class passage (£90) for self and wife in the *Red Rover*. Shortly after departure plaintiff remonstrated about the provisions, especially fresh bread, and was forcibly seized and confined seven days in his cabin. His health suffered; the passengers petitioned, and he was released. Capt. STEWART's entry in the log-book, was read to plaintiff in his cabin. "Whereas, on 2nd May, 1866, Mr. ALDWORTH, a saloon passenger, was confined to his cabin for his insolence in putting his hand to his nose to the captain, which was witnessed also by RICHARD ROGERS, apprentice, and he is required there to stay until he writes an apology." Plaintiff admitted laughing or grinning at defendant. Damages £25.

842. **Passenger in irons.** At the Bombay Police Court, on the 24th September, 1869, Mr. JOHN FRANCIS GRAVES, a cornet in the 20th Hussars, made a charge of assault and false imprisonment against Capt. THOMAS WYLIE, of the ship *Thomas Bell*, from Gravesend. It appears that on the 21st May the prosecutor and a number of other officers of Her Majesty's Army embarked to join their regiments in India. From the commencement the captain did not seem to have treated his passengers with the consideration which English officers expect, and the prosecutor was addressed in an abusive and threatening manner. On the 29th of June, while lying half asleep on a couch in the saloon, he heard the captain make some observation about putting sticking-plaster on a certain part of his person, and after that the steward went out and brought in a roll of it, which was put on him as the captain indicated. He immediately rose and expressed himself in the strongest terms on such insolent conduct. The next day the captain ordered him to be put in irons and confined in the hold for 26 hours, with only bread and water to subsist on. On the remonstrances of the other passengers he was released. On arrival he made the Brigadier-General of the regiment acquainted with the facts, and he ordered proceedings to be taken against the master. Prosecutor admitted in cross-examination that he might have sung some immodest songs near the man at the wheel, and that on two occasions he came on deck with no clothes on. He once said "if things came to their worst we would have to ask the chief officer to take charge of the ship." At the close of the evidence the chairman gave the following decision:—"I think that the charge of an assault accompanied with force made by the complainant has been well and fully proved by the evidence. The law vests great power in a shipmaster. It has been found necessary to do so in the interests of society, for the preservation of life and property, and for the maintenance of law and order. But great power involves great responsibility, and the exercise of it is required to be accompanied with judgment and discretion. Where the safety or safe working of a ship is concerned, I do not know what a shipmaster might not lawfully do. Certainly, putting anyone, whether a gentleman passenger or anyone else in irons for 26 hours, in the face of such circumstances, would be a very small matter indeed; but there is no pretence of such a situation here. The captain and his passengers do not, indeed, seem to have been the happy family that so many of us have had the pleasure of being members of during a sea voyage, and I do not say that Mr. GRAVES, and perhaps other passengers, may

not have given some provocation. But, unless under the provocation of a coarse, insolent, and unwarrantable practical joke played off on Mr. GRAVES, to which the captain himself was a party—if he ought not to be put down as in fact the author—when Mr. GRAVES addressed the captain in a way that it is certainly not desirable for passengers to address captains, though, under the circumstances, I do not say that he either said or did more than any man of the least spirit could have been expected to say or do—with that exception I find that Mr. GRAVES did literally nothing to provoke any hostile action. On the contrary, the offence was all the other way from first to last; and I say, putting Mr. GRAVES in irons under the circumstances detailed, and placing him where he was amid dirt and filth, to say nothing of the wanton indecency which was made an incident of the occasion—I say that that altogether was an offence for which any fine that I have power to inflict would be no adequate punishment. Mr. GRAVES has his civil remedy for what, I have no hesitation in saying, I consider was his false imprisonment. But I think he has been well advised in the public interest to come here and prosecute as he has done. He has not by anything that has been brought out in evidence, forfeited his position as an officer and a gentleman, and undoubtedly it was best for him to submit at the moment to the indignity. But the indignity was a grave public offence, and it is only with reference to such public offence that I act. I am not ignorant of the possible serious consequences to the captain by the sentence which I am now about to pronounce, but, whatever that may be, he must know that he has by his own misconduct, brought them all upon himself. For my part I know I take a dispassionate, and for the captain I think I take a considerate, view of the case, when I sentence him only to 14 days' imprisonment in the house of correction, with hard labour."

843. Open Hatchway. Brevet Lieut.-Colonel SCOTT, 35th Madras Native Infantry, took passage in the P. & O. Co.'s ship *Pera*, to sail 20th January, 1867, from Southampton. On the 19th, between four and five p.m., he went on board to look at the cabins. He was met at the saloon entrance by the purser, who directed Colonel SCOTT where to go. The light was very dim, and when walking in the direction indicated the colonel fell down the open hatchway of the bullion hold, which was under the floor of the saloon; his shoulder was dislocated, and he received other injuries. At RADLEY'S hotel he was visited by three medical men, who reduced the dislocation, and he proceeded on the voyage, but was incapable of executing his military duties, and was placed on half-pay, £292 per annum. At the time of the accident he received £53 per month as Assistant-Adjutant-General, besides his full pay £78 per month. At the trial, Queen's Bench, 11th May, 1869, the jury awarded damages £3,750.

844. Breach of Passenger Contract. The *Lady Wodehouse*. City of London Court, before Commissioner KERR, 20th November, 1869. *DALY v. ROBINSON*. Mr. Commissioner KERR gave judgment in this case, which was an action brought by the holder of a return ticket for expenses he had been put to in not being able to come back from Dublin in one of the defendant's steamers. The defence was that the owner was not liable for unavoidable delay, and owing to some casks of petroleum on board the *Lady Wodehouse* taking fire, she was so much damaged that she was not able to take her turn on the station. The answer to this was, that the defendant had been guilty of negligence in stowing the casks of petroleum on deck and not securing them. His Honour said there was evidence of negligence in not having the casks so secured as to withstand the influence of the storm. Judgment would, therefore, be given for the plaintiff.

845. **Wharf Accident.** Common Pleas, Westminster, 7th December, 1869, before Mr. Justice BYLES. *BOWMAN v. LIVINGSTON*. Mr. T. J. CLARKE and Mr. MANSEL JONES appeared for plaintiff; Sir GEORGE HONYMAN and Mr. MURPHY for defendants. Plaintiff was mate of a merchant vessel. Defendants are wharfingers and lessees of the Irongate wharf. Among other purposes the wharf was used as a place of departure for the vessels of the Tyne Steam Shipping Co. On the 22nd August, 1868, plaintiff, who was to sail as a passenger on board one of those vessels for Sunderland, arrived at the wharf, deposited his luggage on board ship, and went back up a staircase to the office of the company, to take his ticket. Having obtained it he left again, and there was then a van standing nearly opposite the staircase and between it and the vessel, which he said was not there when he went up. This van was discharging bales of wool, not with a crane, but simply thrown from the van to the wharf. According to plaintiff's case he had no reason to suppose that the van was unloading, or that anything dangerous was going on, and no warning was given him. He went on from the staircase towards the vessel, passing behind the van. Just then a bale fell, struck him, and injured him severely. He sustained a compound fracture of the leg, and had to undergo several painful operations, was eight months in hospital, and was unable to resume his trade with safety. According to defendants' case, the unloading of the van was being conducted in the ordinary way, without negligence; what was going on ought to have been seen by everyone; full warning was given to plaintiff, and he was even held back by defendants' servants, but being in a hurry to reach the ship, he broke from them and chose to take his chance of avoiding the falling bales, so that the injuries arose from his own fault. Verdict for plaintiff £350.

846. **PATCHOULI.** In a drug circular it is stated that the production of patchouli is large, and the price would be very low but that there is a great difficulty in getting it shipped, as captains object to its strongly scenting the other cargo. It may be conceived how nice a tea shipment would turn out which had been accompanied by patchouli.

847. **PEAS.** The Admiralty compute a bushel to weigh 64 lbs.; see the article grain, Mediterranean rates, &c. The Danish polacca brig *Edith*, Capt. OLSEN, loaded peas at Dantzic in 1864, left 25th November, and arrived at Plymouth, 21st December. She is 84 Danish feet long, 25 feet broad, and 11 deep (12 inches English = 11½ Danish); and registers 68 lasts—145 tons English. With the peas, 895 quarters by manifest, she drew 11½ feet aft and 11 forward—her draught with a cargo of coal. There was space enough left to take 100 quarters more, but as the peas averaged nearly 64 lbs. per bushel, the cargo weighed as much as she could conveniently "stow and carry." Delivery, 877 quarters, or 893 quarters of 63 lbs. per bushel. Dunnage, spars, covered with mats—350.

848. **Deficiency.** A merchant asks the *Gazette*, 6th January, 1866. 520 qrs. of peas were shipped at Dantzic, with 55 of an inferior quality over. Some of the mats used for separation were so

thin as to permit peas to run through. The 55 quarter lot turned out 3 quarters short; the 520 quarters only six bushels, or about half per cent. on the whole cargo, which is not too much deficiency from the Baltic (the cargo being guaranteed within one per cent). Has the holder of the bill of lading of the upper parcel a claim on the holder of the under lot, he having intimated the deficiency by letter, stating that as a runnage had taken place they would claim a proportionate decrease on the whole cargo; or have they a claim on the master, the bill of lading being signed "weight unknown" but not free from runnage? The editor answers: the claim of the holder of the bills of lading of the uppermost cargo is against the shippers, unless defective stowage can be brought home to the ship—against which then the claim would be. There is no claim against the holders of the bills of lading of the under lot.

849. PECUL, PICUL, a Dutch measure of capacity, the principal heavy weight used in most of the markets of the Eastern Archipelago. At Macao, the Portuguese have three kinds, viz.: the pecul balanca of 100 catties=133 lbs. 5 oz. 5.333 dwts. avoirdupois, the pecul seda of from 111 to 115 catties=148.2 lbs., the pecul chapa of 150 catties=200 lbs. At Singapore, 16 peculs and 80 catties make a ton, and 40 peculs a coyan. 90 catties seda=a Canton pecul or pecul balanca. By the first or pecul balanca are sold cotton and valuable articles; by pecul seda, alum, pepper, and coarse goods; and by pecul chapa, rice. An iron vessel, 275 tons register, 400 tons dead-weight, took 6,000 peculs paddy and rice in bags.

850. PEPPER. Ships of 350 tons burthen, require 25 or 30 tons of ballast stowed fore and aft, and closely planked over, to prevent the pepper from working down. Some masters fill all empty casks, bags, &c., in order to make up the deficiency caused by shrinking when the cargo becomes dry. At Singapore pepper in single bags requires great care to prevent them from bursting. This pepper is so hot and dry that it often does extensive injury to the hold; where there is the least sap in the beams, or the planks forming the skin, the heat soon gives it the appearance of rottenness, and the ceiling dries and opens; it should be stowed somewhere in the middle of the hold; if near it will seriously injure coffee and other delicate articles. From fourteen ports on the western coast of Sumatra, it is calculated that twenty million pounds are exported annually; the **harvest** is usually about September and October; a smaller crop is gathered in March and April. Cayenne pepper is generally in wine bottles in Sierra Leone; rats will attack bales of cayenne pepper and

fatten on the pods. The brig *Sunium*, 268 tons, Capt. W. MATTHEWS, belonging to Messrs. TINDALL & Co., of Scarborough, left **Penang** 23rd July, 1864, with

3,083	Bags of black pepper,
395	Buffalo hides,
2,822	Bags sugar,
1,519	Bundles of rattans,
49	Cases of nutmegs,
2	Cases of tortoise shells, and
2	Cases of fish maws.

She is 103 feet long, 25·7 broad, 15·5 deep; 'tween decks 6 feet. With this cargo she drew 13 feet 4 inches aft, and 13 feet 2 forward, and on arriving in London 20th November, 13½ feet aft, 13 feet 1 inch forward; with 406 tons Sunderland coal 15 feet aft, and 14 feet 7 inches forward; best trim at sea 13 feet 8 inches and 13 feet 4 inches. The sugar being only one-third of the cargo, was placed below fore and aft as a dead-weight to keep the brig stiff, pepper next; hides over; about four tiers of pepper in the fore hatchway; screwed down and filled up with pepper before the screws were removed; cases of nutmegs across on three tiers of pepper in the after hatch, with five tiers of pepper on top; pepper up to main hatch; some nutmegs in the cabin. She was dunnaged with thick wood from the mainmast to the fore hatch 12 inches; bilge 14; sides 3 inches; rattans in the ends 16 inches compressed to 14; and in the sides 6 inches compressed to 5. Double mats on dunnage to receive the sugar; thin battens also would have been very useful. The pepper was in single gunny bags; each about 109 lbs. gross, 105 lbs. net. Sugar in double mats; each bag averaged 115 lbs. gross, 112 lbs. net. The cases of nutmegs measured 3 feet 2 inches by 2 feet 2 and 1 foot 10; the exact weight of nutmeg cases as freight is paid by measurement; the weight is about 122 lbs. gross. **Port charges** inwards at Penang *nil*; outwards 2s. 6d.; **pilotage** in, optional, say £1; and out say £1. **Season of shipment** of the above cargo January to September.

Tonnage. Bengal and Madras ton 12 cwt. long pepper, 14 cwt. black, in robbins; Madras and Bombay 16 cwt. in bags. **Weights.** Black pepper in company's bags 316 lbs.; free trade in bags, 28, 56, and 112 lbs.; a bag of white pepper contains 1½ cwt. A Ceylon parah 27 to 30 lbs. Java goelack about 2 lbs.

851. **PEPPERMINT.** About 3,000 acres of it are under cultivation in North America, viz.: 1,000 in New York and Ohio, and 2,000 in Michigan. It is raised exclusively for its oil, about 7 lb. of which is the average yield from an acre of plant, the prices being 10s. 7½ lb.

852. PERUVIAN BARK. The proper season for cutting the bark in Peru, is from September to November—the only months in the whole year in which the rainy season wholly intermits in the mountains. That shipped at Arica is packed in small bundles made of hides.

853. PETROLEUM OR ROCK OIL, from the wells in Canada and the United States, emits an odour so penetrating and noisome that two or three casks in the same hold, have so much injured a cargo of wheat, as to render it unfit for human consumption; flour and vegetables soon become unpalatable. In 1862, the ship *Afton*, Capt. SOUPER, shipped at New York 250 barrels of apples, which were stowed in the hold with 1,800 barrels petroleum; the odour penetrated the apples, and the master threw 244 barrels overboard. A cargo of petroleum leaves in the hold a stench which completely impregnates the wood, and makes it difficult for the ship to obtain a freight for first-class goods. An experienced master says, "when I was at New York, 1864, I thought to engage petroleum, but was informed that the grain merchants there had lately refused two vessels after charter was made, although one was all ceiled, because they had just discharged petroleum. A surveyor advised me not to take it; he had just surveyed some goods in a vessel damaged by kerosene oil, which she had had in the previous voyage to Europe; heavy claims would be made against her. Notwithstanding this, I have heard that the smell, &c., soon leaves if ordinary care be used in cleaning vessels." Petroleum oil from Pennsylvania is less sulphurous than that from Canada, and is said to be not more offensive than turpentine or similar products. Petroleum oil is now much used with rape for lubricating purposes, and at a very moderate temperature gives off an inflammable gas and burns like spirits. The oil, in consequence of its dangerous character, is not admitted into some of the public warehouses in London. There is a mode of refining rock oil which renders it much less dangerous.

854. On the 29th September, 1869, a terrible conflagration occurred at Bordeaux. The steam-ship *Count of Hainault*, from Antwerp, arrived in the Garonne, having on board about 40 tons of petroleum and petroleum spirit, and was moored at Lormont, about three miles below the city, being the station for discharging cargoes of this dangerous description, and proceeded to discharge her cargo into barges, one of which was laden with petroleum and spirit and the other with spirit only. By 6 p.m. the operation was complete, and the steamer took her station at 7, alongside the quay at Bordeaux. The two barges remained at Lormont, having to convey their cargoes

to the Gursol Docks at La Bastide, higher up the river, on the following morning. In about a quarter of an hour after the steamer left, one of the men in charge of the barge, named the *Trinitè*, which had the petroleum spirit on board, after having lighted a torch, imprudently threw away a still burning lucifer match among the casks, one of which caught fire, producing a terrible explosion, by which the man who was the cause of it and a Custom-house officer, were dreadfully burnt about the face, legs, and hands. In a few moments the barge was in flames, when her warps snapped asunder, and the burning mass drifted with the tide up the river, facing the general warehouses. Some small steamers belonging to the port, with sailors and firemen, at once got up steam and made for the still burning barge, which they temporarily secured with a chain, and then made efforts to sink by pumping water into it, but for a considerable time without avail. One of the steamers, the *Mathilde*, caught fire at the bows. Eventually the commander of the lifeboat *Monte Christo*, after the repeated orders of the captain of the port, succeeded in scuttling the barge at the stern. A train of liquid fire came from the barge, and was drifted by the current in the direction of a mass of ships, and speedily communicated itself to them. Almost at the same moment three or four vessels were discovered to be on fire, with no means at hand of rendering them the smallest assistance. Up till 11 o'clock the tide was coming in, and the floating fire rising with it, several other ships became ignited. Those most heavily laden were the first to suffer, as their copper bottoms being below the water-line, their wooden sides offered no resistance to the flames, whereas the unladen vessels, protected by copper, for the most part escaped. Had the tide continued rising two hours more, half the ships in the port would have been destroyed. As it was, the returning tide did considerable amount of mischief, as it carried out with it the floating fire, together with the remains of the burning barges and portions of the ignited ships, which set fire to other vessels in their turn, until within the space of less than two miles, nearly twenty-five ships were to be seen on fire at the same moment. A strong south-east wind helped to increase the destruction. At half-past seven in the morning 14 vessels were still to be seen in flames or smouldering with their hulls burnt almost down to the water's edge. The damage was estimated at £100,000 to £200,000.

855. Petroleum and Spirits. To the Secretary, Underwriters' Rooms, Liverpool. Dear Sir,—According to your request, we have made inquiries among a large number of shipowners, overlookers, and

masters of vessels, together representing a large proportion of the shipping interests of Liverpool, respecting the use of petroleum oils and spirits on board their vessels.

We have been informed by several shipowners who formerly, and up to a comparatively recent date, sanctioned the use of petroleum and paraffine on board their vessels for side, binnacle, and cabin lights, that they have now discontinued to do so.

After numerous inquiries we find only a few cases where the present use of spirituous oils has been admitted, the almost *unanimous opinion of those persons with whom we have communicated being that the use of petroleum and its various spirits on board ship, is highly dangerous*, as they require very great care in handling and dealing with them so as to prevent accident by fire.

We are informed that the various spirits sold under the names kerosine, kersoline, petroleum, paraffine, benzine, &c., are all of the same nature, and that although some are not quite so dangerously volatile as others, they all require so much care in their use as to render it imprudent to employ them on board ship.

We find petroleum more generally used by American and Colonial owned vessels, and by vessels under the Dutch, Belgian, and German flags, than by British-owned vessels. The dealers in these oils and stores also inform us that within the last year or two the demand for them for use on shipboard is much less frequent, and that the use of animal and vegetable oils has become more general.

Spirits of petroleum, as a substitute for spirits of turpentine as driers for mixing with paint, have, we are informed by the dealers, been in use to a considerable extent on board ship while turpentine was expensive, particularly during the time of the American war. This article is now only occasionally used, and only supplied when specially inquired for, as it is considered dangerous by those who supply it.

The inquiries which we have been making into the use of petroleum oils and spirits on shipboard have, we believe, had the effect of diminishing their use in Liverpool ships. There can be little doubt that, from carelessness or accident in the use of these oils and spirits, the liability to fires on shipboard has much increased.

Signed,

J. M. CAWKITT, *Chief Surveyor.*

HENRY OAKLEY, *Surveyor.*

Liverpool, 9th Dec., 1868.

856. The brigantine *Acadian*, dimensions of which are stated in the article fruit, arrived at Philadelphia in November, 1863, and having discharged raisins, took in 814 casks petroleum oil, each containing 38 gallons. They were lowered down by horse-power, and stowed in three tiers, excepting a small quantity amidships in four tiers. With this cargo she drew 10½ feet aft, and 8½ forward. Her disbursements and expenses at Philadelphia for discharging and loading were—

DISBURSEMENTS :

	\$	c.	£	s.	d.
Cash and Interest			50	8	4
To Captain, at various dates.....	385	78			
Premium for insuring vessel	168	75			
Advertising crew, \$1 25c. ; Stove repairs, \$9 75c.	11	0			
Sailmaker, \$72 80c. ; Rigger, \$5 9c.	77	89			
Cooper (water casks), \$3 85c. ; Carpenter, \$12 75c. ...	16	60			
Flour, \$7 50c. ; Water \$5 ; Apples, \$10 25c.	22	75			
Beef, \$51 50c. ; Provisions, \$166 22c.	217	72			
Coal, \$9 50c. ; KING's draft, \$4	13	50			

PORT AND CARGO CHARGES :

Towage inwards	80	0			
Discharging 125 tons @ 50c.	\$62	50c.			
Loading 815 barrels of oil @ 8c.	\$65	20c.			
Three days' work extra	\$2	75c.			
Shipbroker, health fees, \$10 ; writ, &c., \$10 ; warden, 50c. ; Customs' entrance, \$2 50c. ; surveyor, \$3 ; manifest, \$4 ; tonnage tax (war), \$16 70c.	192	54			
Wharfage, January 23rd to March 7th, @ \$2 50c.	107	50			
Insurance	19	10			
Cordwood, \$15 ; Three boxes, \$11 7c.	26	7			
Commission on £350			8	15	0
Pilotage from the Breakwater, draught 10 feet 6 inches, \$41 50c., and seven days' detention money, \$14	55	50			

The total disbursements were £263 10s. ; freight, £350 ; gratuity, £15 15s. ; total, £365 15s., leaving a balance in favour of the *Acadian* of £102 5s., which was credited by the brokers at 171, making \$777 9c., and return commission, £3 13s. 4d. at 171, \$27 85c., final total, \$804 94c. Pilotage from the city, \$35 ; steamboat, \$35 ; to Navy Yard, \$5 ; Consul, \$15 75c. ; boat, \$10 ; advance to two new seamen, \$150 ; paid 185c. commission for a bill (£50) on London. The expenses were increased in consequence of the intestine war, and the coldness of the season. The war tax was \$16, the pilotage, &c., was greater through the thickness of the ice. [Mr. PIERREPOINT says, that while Congress has power and does pass statutes which control duties and custom-house regulations, each state takes care, by acts passed in its own legislature, and by ordinances emanating from corporations in seaboard cities, to have protective regulations relative to local matters, as for instance, quarantine, wharfage, pilotage, &c.]

PHILADELPHIA PORT CHARGES.

PILOTAGE in. Up to 12 feet, \$3 74c. per foot ; over 12 feet, \$4 16c. for every foot. **Outwards :** \$3 per foot.

Vessels from foreign ports are by law bound to receive a pilot, and on arrival the master must report to the Warden's office, or failing to do so, incur a penalty of \$10.

For every day the pilot is detained beyond the ordinary time for transporting the vessel (by ice or other causes), he is entitled to \$3 per day.

From 1st November to the 1st April an extra charge of \$10 per vessel is made, being winter months.

Every vessel is bound to remain at the Capes twenty-four hours after its arrival, to give the pilot an opportunity to be taken out, under a penalty of \$800.

CUSTOM-HOUSE CHARGES. *In* and *Out* about the same as New York.

TOWAGES IN HARBOUR. According to distance. From 125 tons register to 325 tons, from \$4 to \$8 ; 325 to 650 tons, \$8 to \$10 ; 650 to 800 tons, \$10 to \$16. To and from Schuylkill River. Vessels from 125 to 200 tons register, light or loaded, \$15 ; 200 to 300 tons, \$18 ; 300 to 400 tons, \$20 ; 400 to 500 tons, \$25 ; 500 to 600 tons, \$30 ; 600 to 700 tons, \$35 and upwards. To and from Chester (on the Delaware River, about fifteen miles from Philadelphia) and points below.

VESSELS FROM

	\$	\$	c.
125 to 200 tons register	16 and 1	00	per mile below.
200 „ 250 „	18 „	1	10 „
250 „ 325 „	20 „	1	15 „
325 „ 400 „	22 „	1	20 „
400 „ 475 „	24 „	1	25 „
475 „ 550 „	26 „	1	50 „
550 „ 650 „	30 „	1	75 „
650 „ 800 „	35 „	2	00 „
800 „ 1000 „	40 „	2	25 „

WHARFAGES. Little variation. From \$3 50c. to \$5 per day, according to size.

STEVEDORE DISCHARGING. Same as New York rates. Loading : petroleum oil, in barrels, 8c. each ; and in cases, 2c. each. General cargo and coal, 40c. to 50c. per ton.

857. By 25 & 26 Vic., cap. 66, sec. 2, every vessel carrying a cargo of petroleum, wholly or in part, on entering any harbour in the United Kingdom shall conform to such regulations in respect to the place at which she is to be moored, as may from time to time be issued by the harbour authority. If any vessel is moored in contravention of such rules, the owner or master shall incur a penalty not exceeding £20 each day, and it shall be lawful for the harbour master, to cause such vessel to be removed at the expense of the owner, to such place as may be in conformity with the said regulations, and all expenses incurred may be recovered in the same manner in which penalties are hereby made recoverable.

858. The products obtained by refining petroleum consist of kerosene or turpentine substitute, a very light colourless volatile liquid highly inflammable both in the liquid form and the state of vapour, which is more inflammable even than spirits of wine or alcohol. Packages in the hold should therefore be approached only with a wire gauze lamp; the collier's safety lamp is the best. Kerosene, photogen or lamp oil, is a heavier colourless liquid, less volatile but very inflammable. The petroleum lubricating oils are of greater specific gravity, very much less volatile, but still highly inflammable when spread over a surface. The kerosene is usually packed in tin cans containing four gallons each, and two to four of these cans are put into a strong wooden box. In 1866 a vessel from the Eastern States was discharging kerosene at San Francisco. The wooden packages were uninjured, but the cans leaked considerably when coming out. The vessel had shipped water, which, running over the packages, had rusted the tins but not sufficiently to perforate them and cause loss in the ship's hold; as soon however as they were moved the rust gave way, and by the time they reached the wharf they were leaking in streams.

859. **Casks?** A master asks the *Gazette*, 19th December, 1865, "I chartered my vessel in England to load in Baltimore a cargo of petroleum in usual sized casks for a direct port, at a rate per barrel of 32 British gallons delivered. On her return I employed a guager (and gave notice to the merchant) to average what each cask should contain. His statement runs thus:—456 casks petroleum grease, 34 gallons equal to 15,504 gallons; 50 casks refined petroleum, 34 gallons equal to 1,700 gallons; 782 casks refined petroleum, 34 gallons equal to 26,588 gallons. You will therefore see that the casks average the size of 34 gallons each, and yet the merchant refuses to pay more than if they were 32 gallons. The difference is about 80 barrels." The Editor answers: the ship has a right to be paid at the rate of 32 British imperial gallons per barrel, and to have freight adjusted on that basis.

860. **Explosion.** In 1862, a cask of this oil for lubricating purposes, was in stock at Fleece Mills, Keighley, and was placed in a tank. Two men with a naked light approached within six feet, when an explosion took place, and the oil blazed fiercely. In attempting to remove the cistern it upset, and the room was immediately enveloped in flames; the men escaped, raised an alarm, and the fire was extinguished; see the *Lotty Sleigh*, in the article gunpowder.

861. **Explosion.** Boston, 15th May, 1862. On Monday an explosion occurred on board the schooner *E. W. Pratt*, 218 tons burthen, lying at the foot of Christian Street, Philadelphia, partly loaded with coal oil. The hold contained about 1,100 barrels of oil in a crude state. About 50 were on deck, and from 200 to 300 on the wharf to complete the deck-load. There were also on

deck about 50 boxes, each containing two large tin cans of refined coal oil. The crew consisted of Capt. NICKERSON, W. E. ROBBINS, mate, F. T. ROBBINS, steward, and four seamen. The master and two seamen were ashore; the steward was in bed; the mate was sitting in the cabin, and the gas from the oil, which filled the apartment, caused him to become drowsy, and he fell asleep. He was suddenly startled by the explosion and was thrown violently across the room. The roof was lifted up, and finding himself enveloped in flames, he rushed on deck, jumped into the boat at the stern, cut loose, and got into the water. His face was badly cut, and his right hand burned almost to a crisp. He saw FREEMAN T. ROBBINS struggling in the water, but before he could render any assistance the unfortunate man, who was lame and unable to swim, was drowned. A small boat put off and rescued the mate, who was taken to the hospital; his injuries, though painful and shocking, are not dangerous. Two of the seamen PEASE and HOLLEY, were in the forecabin; the former was asleep, the latter reading. HOLLEY saw the vessel suddenly lighted up; he aroused PEASE, and the two rushed on deck, which at that time was one sheet of flame. A piece of old chain, lying near the windlass, was blown against HOLLEY; it struck him on the arm. The two stumbled and fell, but recovering, rushed through the fire and got on the jibboom, from which they dropped into the river, and swam to the wharf. Both were considerably burned about the hands and arms. In a few seconds the schooner was enveloped in flame from stem to stern, and the fiery element leaped up the rigging to the tops of the masts. She became a total loss. The coal oil, valued at 5,000 dollars, was all destroyed, and a large quantity of that on the wharf shared the same fate. Lying near in the dock was the ship *Grey Eagle*. It was difficult to get her out of harm's way: she took fire twice, and was seriously damaged. At one time the whole of her bow and forward rigging were in a blaze, caused by the quantity of burning oil which floated on the water. The explosion is attributed to the large accumulation of benzine gas which filled the cabin, and thus came in contact with the light.—*Boston Post*.

862. **Explosion.** Liverpool, 24th October, 1862. Early this morning a telegram from Waterloo, stated that a large ship was on fire on Taylor's Bank (distant five miles), and in consequence of a strong smell of petroleum, it was believed that she was homeward bound from one of the North American ports. It was the *Hindoo*, from Montreal. She was overtaken in the Channel by a fearful gale, and after working up as far as the Bell Buoy, the gale raged so furiously, and the ship was so disabled, that she became almost unmanageable; to prevent her if possible from drifting, her masts were cut away. This precaution proved unavailing, for being propelled both by wind and tide, she drove on shore near Formby. Endeavours were then made by those on board to reach the land in safety; but besides the storm another fearful enemy arose—the ship was discovered to be on fire. The crew, seeing there was no chance of saving anything, made for the beach. After swimming through a sea of petroleum—for the cargo, 3,000 barrels, had broken up, and was washing out—the crew, with the exception of five who were drowned, reached the land. Many were severely injured, and Capt. MURPHY was crushed by the drifting wreck, besides being nearly poisoned with petroleum. At 10 o'clock to-day not a vestige of the ship was visible; but that there had been a fire of petroleum there could be no mistake, for the stench from the vicinity of the wreck prevailed all over Liverpool; and so great was the effect on the Exchange Newsroom, the floor had to be sprinkled with chloride of lime.

863. **Explosion.** On the night of the 9th October, 1863, as the schooner *Orion*, of Hamilton, with a cargo of petroleum, was proceeding along the Welland Canal, one of the men went into the hold with a lamp in his hand, and there being a hole through which the gas generated by the oil had made its way, an explosion took place, which was heard for miles around. All on board were blown into the air, and fell into the canal, and the master and three of the men were drowned. Before they could reach the shore, the flames had communicated with the petroleum on the surface of the water about them which then burnt with a fierceness and strength fully equal to "Greek fire." The master struggled manfully, but he sank to rise no more.

864. **Explosion.** Baltimore, 27th June, 1864. The destruction of the Italian brig *Eduardo* on the 24th, loading petroleum oil here for Liverpool, was caused by the cargo exploding. Everything moveable on deck was sent a considerable distance in the air. Two of the crew were blown overboard, but were not severely injured; several of the stevedores' gang were burned about the face and hands. The burning vessel was towed to the opposite side of the harbour and scuttled. The Marine Surveyors are of opinion that the explosion took place in the lower tier of barrels.

865. **Explosion.** Antwerp, 23rd January, 1865. Last evening, the Netherlands tjalk *Gesiena*, Capt. WOLVINGA, lying in the Canal des Brasseurs, laden with petroleum oil, exploded with a heavy report, blowing in the air and killing a woman and two children. Several other vessels, including the *Elsiena* and *De Vries*, took fire and experienced considerable injury.

866. **Explosion.** The barque *Meteor*, 363 tons, Capt. MASON, left New York 12th June, 1867, and on the 14th blew up, took fire, and was burnt. Seven of the crew perished; six were rescued by the Prussian barque *Lucy and Paul*, Capt. SCHERL, and landed at Falmouth.

867. **PHOSPHORUS**, a violent irritant poison, largely imported from Germany; specific gravity 1.770. It inflames at a very low temperature, and is kept with water in bottles or jars; breakages should be avoided.

868. **PIANOFORTES** for Australia are sometimes covered with the best blankets, and then packed in zinc cases enclosed in wood, or in wood cases lined with tin or zinc; the blankets and zinc will ordinarily sell well in the colonies; sometimes they are packed with cotton. Pianofortes should be stowed the right end up, in a dry berth. Cottage pianos in cases measure 45 to 50 cubic feet; CADBY's piccolos 68 feet.

869. **PILCHARDS.** As ships usually load by the head, the stowage should commence close aft, thus leaving the broken stowage forward; the dunnage generally used is a plank or two each side of the keelson, to keep the casks clear from the waste oil and garbage which would otherwise stick to and soil them, and diminish the marketable value of the fish; but they are often shipped without dunnage, excepting some pieces of wood to keep the casks steady;

it is usual to unship the limber boards to allow the waste oil to run freely to the pump-well. Ordinarily no ballast is required, and pilchards will stow up to the deck. The casks, which have very little bilge, are placed one on the other, but to meet the inequalities of the hold, wedges are fitted to keep the tiers true; as they are very slight, the crowbar should be used as little as possible. Careful stevedores always back the casks, that is, they sit down and with their feet force them into their proper places. Vacant spaces can be measured with a hoop to ascertain where casks will stow, and thus save useless labour, and prevent them from being jammed into an oval shape.

870. The casks turned out of the cooperage have generally only ten hoops, and the merchants fit crossbars to the heads. Masters should refuse casks which have not ten hoops, and not take any in a dirty state, for they will entail a bad character on the whole of the cargo, on delivery. Merchants prefer stowing 5 hogsheads only to every ton register, *o.m.*, to secure proper ventilation, and prevent undue pressure. Vessels from 80 to 120 tons register are usually employed. A schooner 111 tons, *n.m.*, shipped 704 hogsheads at Penzance. Another schooner 86 tons, *n.m.*, shipped 600 hogsheads, leaving space to stow 20 more.

871. Nine hogsheads weigh about two tons; in stowing, some calculate 6 for every ton *n.m.*, and 5 for every ton *o.m.* The length of a hogshead is 54 inches, and breadth of head 22 inches. A hogshead of pilchards, well cured and pressed, will weigh about 476 lbs., and contains 50 gallons wine measure. The number in a hogshead is estimated at 2,500 to 3,000 fish. The fresh fish in a hogshead weigh about 6½ cwt. and the salt about 3½ cwt.; but the weight of the hogshead when cured and pressed is reduced to about 4½ cwt., including the weight usually allowed for the cask, 28 lbs. Ten thousand pilchards make a last; a barrel 41½ gallons. Pilchards arrive on the coasts of Devon and Cornwall from June to September; sometimes they are caught about Christmas. Lobsters are in season from September to June; oysters 1st September to 30th April.

FORM OF CHARTER-PARTY.

		<i>Port of</i>	<i>day of</i>	187
It is this day mutually agreed, between		of the good ship or vessel		
called the	of	At. and coppered, of the measurement of tons,		
N.N.M., and	tons O.M., or thereabouts, now at	and	of	
merchants; that the said ship being tight, staunch, and strong, and every way				

fitted for the voyage, shall, with all convenient speed, sail and proceed direct to and there load, from the Factors of the said Merchants, such quantity of Pilchards in Hogsheads, as they may think right to ship; the Charterers binding themselves to pay freight on not less than Hogsheads, provided such quantity does not exceed what she can reasonably stow and carry, over and above her Tackle, Apparel, Provisions, and Furniture; and being so loaded shall therewith proceed to a port in the Mediterranean or Adriatic (to be named by the Charterer's Agents when the Vessel is ready for sea) for orders, whether to discharge the Cargo there, or to proceed with the same to another port (it being understood that the Vessel is not to be sent to a port in the Mediterranean after calling at a port in the Adriatic) or so near thereunto as she may safely get, and deliver the same on being paid Freight, at and after the rate of

per Hogshead if the Cargo is discharged at Leghorn, Genoa, or Civita Vecchia ;
per Hogshead if at Naples or any other port in the Mediterranean ;

per Hogshead if discharged at Ancona ;

per Hogshead if discharged at Venice or Trieste or any other port in the Adriatic, (it being understood that if the rate of Freight for the port to which the Vessel may be sent for orders shall be above the rate fixed for the port of discharge, the higher rate is to be paid ;

with ten per cent. Primage in either case—the act of GOD, the Queen's Enemies, Fire, and all and every other Dangers and Accidents of the Seas, Rivers, Navigation of whatever nature and kind soever during the said voyage, always excepted). The Freight to be paid on unloading, and right delivery of the Cargo, in Cash, or by approved Bills in London, at usance. Thirty running days are to be allowed the said Merchants for loading and discharging the Ship, to commence at the loading port on the day of next ensuing, provided the Vessel is then ready to receive the cargo, and at the port of delivery on the Vessel being admitted to a free Pratique ;—and ten days Demurrage, over and above the said lying days, at pounds per day. It is further agreed, that if the Vessel should be sent on from one lower to another lower port, or from one higher to another higher port, the sum of pounds shall be paid in addition to the Freight in lieu of all Port Charges and Pilotages ; but if the Vessel should be sent to a higher from a lower port the sum of pounds shall be paid in addition to the Freight. It is also agreed, that in case of the Vessel being sent to a port for orders, the Agent of the Charterers shall give such orders within twenty-four hours after the arrival of the Vessel within the port, or pay the sum of pounds per day for every day the Vessel may be detained by reason of the orders not being given. The Cargo is to be brought alongside the Ship, at the loading port, and taken from alongside the Ship at the port of discharge, according to the usance of the respective ports ; but the Master is to provide, at the Ship's expense, sufficient Dunnage for stowing the Cargo. And in the event of there being a claim on the said Cargo for average, the same to be settled according to the usage of LLOYDS.

No goods of any description to be shipped by any person except the Charterer's Agents, unless it be with their permission.

The Vessel is to be addressed to the Charterer's Agents at the port of discharge. In case the Vessel shall not have arrived at the port of loading on or before the day of next ensuing, the Charterer shall have the option of cancelling this Charter-party.

In the event of the Vessel arriving at a port in the Mediterranean within thirty days, or at a port in the Adriatic within forty days, from the day of date of the Bill of Lading, the Charterers agree to give the Master a gratuity of one guinea per day, for each of as many days as may remain to expire of such respective numbers of thirty days, or forty days (as the case may be), at the time of the Vessel's arrival; provided too, that the Cargo is delivered in good order.

Five per cent. Commission on the Freight, Primage, and Demurrage, is due to on this Charter-party, and must be paid by the Captain at the port of loading; and if afterwards sent to a higher port, the Commission on the additional Freight to be paid to the Brokers on demand.

Penalty for non-performance of this Agreement pounds.

872. PIMENTO, the dried berries of a West Indian tree, the *Eugenia Pimenta*, a spice intermediate between pepper and cloves; it is also called Jamaica pepper and allspice. At New York and Baltimore 952 lbs. in casks, or 1,110 lbs. in bags go to a ton freight; at Bombay 14 cwt.; a bag weighs 112 lbs. Hamburg tares, Jamaica 2 lbs. per bag; Spanish 3 lbs.

873. PINE APPLES. The schooner *Annie Grant*, Capt. APPLEDORE, belonging to Mr. HENRY GRANT, Kingsbridge, South Devon, loaded pine apples in 1868, in Tarpaum Bay, in the island of Eleuthia, one of the Bahamas. She registers 148 tons, is 90 feet long, 22 feet 10 inches broad, and 12 feet 9 inches deep. Her ballast consisted of 120 tons dry stone, which was levelled fore and aft to meet her trim, and was covered with the flat cuttings from the cargo fittings. Besides this deck there were two others to receive the pine apples; they were equi distant, and rested on beams three inches or more square, supported by uprights. The decks were formed of one or one-and-a-half inch battens, two or three inches wide, laid barely close enough to prevent the pines from going down between—say three or four inches apart. Further to obtain ventilation there was a trunk-way from stem to stern, half the width of the hatchway; the heels secured to the keelson. The sides of this trunk-way were built open, like the decks, and there were three trunk-ways athwartships big enough for a man to go into but without sides, as the bulks were sufficiently tied together by the foliage of the fruit, which is so plentiful that dunnage in the sides was considered unnecessary. The batten stuff used in her fittings came from New York. In this way 4,000 dozen of pines were stowed. She sailed 12th June, and arrived in London, 8th July. During the passage all available hatches were kept open in fine weather. With the pines the schooner drew nine feet forward and ten feet nine inches aft, and behaved well at sea; with 225 tons Newport coal 11 feet 3 inches forward and 13 feet aft. The schooner *Annie Grant's* port charges at Eleuthia

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were £13; freight is usually paid in a lump sum. The apples weighed three to ten pounds each, and were brought off in boats to the anchorage. One day was occupied loading; the time occupied in discharging is somewhat governed by the state of the market. The **season for shipment** of pine apples at Eleuthia is from 1st June to 15th July. When ripe they are liable to decomposition on the passage, and they are therefore shipped in a green state and ripen on board. Sometimes on arrival, if not sufficiently ripe, they are placed in warming rooms. Rainy and damp weather is very injurious to pine apples, and if combined with a long passage will render them worthless. Those for the London market are called sugar-loaf pines; for New York the scarlet pine is shipped; it is much heavier, and the passage being shorter, the pines are taken in bulk; no ballast or fittings; hatchways opened. Chief export of pine apples in that part is from Eleuthia; a few cargoes are shipped at Nassau.

874. An experienced merchant says—Pine apples are grown and shipped from the Bahama Islands, West Indies. Vessels leave there during the months of June and July, and the average passage to London is 31 to 35 days. The number of cargoes usually arriving each season is nine to eleven, and they contain 48,000 pine apples each, which would weigh about 1,350 pines to a ton. There is of course a great difference in some of the cargoes. When a shipper prefers sending a very fine cargo, and selects the fruit, there would be a smaller number to the same weight.

875. The hold of each vessel is fitted with three or four racks, viz., battens of wood, supported by upright posts, thus forming three or four shelves or platforms, the entire length and depth of the hold with the exception of the centre, where a passage is left from stem to stern for admission; the fruit is then placed with a portion of its foliage on (to protect it from bruising) in layers of about five pines deep upon the racks, which are built to prevent the great pressure that would otherwise be upon the lower portion of fruit.

876. Pine apples are likewise grown, and in superior quality, at some of the other West Indian islands, such as Jamaica, &c., but the distance is too great to admit of the fruit being in sound condition, by sailing vessels, and the expense by steamer is more than this article will bear. Some twelve years since a cargo was sent from the island of St. Bartholomew, but the quality was much inferior to those grown in the Bahamas, hence prices were low, and the speculation proved unprofitable and was not repeated. A few pine apples are grown under *glass* in St. Michaels (Azores), and sent to England

during the months from December to May, in the schooners bringing oranges, but the quantity being very small, perhaps six to ten in each vessel ; they are brought in large flower pots with original earth, and generally in the master's cabin. Pine apples are brought in the clipper fruit schooners which are built expressly for that trade, chiefly at Salcombe, in Devonshire ; they are of a very superior class for speed, &c. The importation of pine apple is a great venture, and is usually attended either with a large remuneration, or else a severe loss.

877. PITCH is properly the juice of the wild pine or pitch tree ; and is conceived to be the oil inspissated and turned black further than in the balsam. The best is that from Sweden and Norway ; its goodness consists of its being of a glossy black colour, dry and brittle. It is also described as a substance made by melting coarse hard resin with tar ; the proportion of tar is generally one-half the quantity of resin, but it is regulated according to the consistency of the tar ; for stowage see tar. In Bombay masters are not allowed to boil pitch on board ship, but may do so in a boat alongside or astern. In Charlestown the boat must be anchored in the stream and have a tub of sand in it. Such boilings are not permitted within the limits of the city of Philadelphia. Burgundy pitch or resin from the Norway spruce fir, is imported in the form of tears or small masses, packed in casks containing from one to two cwt. The schooner *Fairy*, dimensions of which can be seen in oil-cake, loaded coal tar tub pitch off Limehouse, London, in September, and discharged the same at Marseilles in November, 1864. The cakes, say 112 lbs. each, were placed in the hold in bulk. The *Fairy* took in 225 tons, when she drew 13 feet 8 inches aft and 11 feet forward. This pitch is cast in half-barrels previously lime-washed inside ; when dry the barrels are removed. Pit pitch is more liable to amalgamate than tub pitch. Pit pitch is cast in pits or long trenches, and when dry is dug out with a pick-axe. Both sorts are made of gas-tar, from which the oil is previously extracted ; it is used for pickling railway sleepers.

878. In 1865 an English owner chartered his vessel (which he says could carry 200 tons dead weight, or 940 quarters of wheat) through a broker in Holland, to load tar or pitch in Archangel at 9s. $\frac{1}{2}$ barrel for Leghorn. As the proportionate rates make "97 quarters of wheat equal to 100 barrels of tar," he calculated that she would take at least 1,000 barrels including deck load, but learnt from his master that owing to the unusual size of the barrels, the merchant had put only 664 below and 36 on deck. Nothing was

mentioned in the charter about size, but it was stated that she could load about 900 barrels. The master, unfortunately, did not note protest. Under the circumstances it was considered that the owner had a right to demand freight according to the rate for 940 quarters of wheat, or for dead freight. The master should have protested, but the omission does not bar the owner's claim.

Tonnage, Freight, &c. 100 barrels of Archangel pitch, 20 tons, admeasure 850 cubic feet or one keel of coal, or 97 quarters of wheat. E.I.Co. six barrels to a ton freight; New York the same. A stand of Burgundy pitch weighs $1\frac{1}{4}$ cwt.; a last consists of 12 barrels; at Rotterdam 12 barrels. An allowance to be made for tare on pitch, of 50 lbs. on Archangel casks, 36 lbs. on Swedish, and 56 lbs. on American.

879. **PLANTS** and small trees are planted in Wardian cases, with sloping glass covers, hermetically sealed, and are usually carried on deck.

880. **PLASTER OF PARIS** or gypsum, is alabaster heated till it becomes a soft white powder, which when mixed with water forms the paste called plaster of Paris; specific gravity 1.872 to 2.288. It will, especially when dry, absorb all ammonia from chloride of lime, manures, &c.

881. **PLUMBAGO**, a carburet of iron, known as black lead, (which see) called also graphite; specific gravity 1.987 to 2.400. Bombay ton 20 cwt. in bags.

882. **Colombo.** An experienced master who traded here in 1860, says—That of plumbago one tier is frequently taken as dead weight; this is not sufficient stiffening for a crank-built ship; stone or other heavy ballast should be used with it. Ships built with beams placed for the West India sugar trade, have not sufficient space between for the large-sized coffee casks, therefore masters of such vessels should look out for this in time, by putting aside all the casks suitable for beam fillings; by using this precaution a larger cargo can be stowed. A ship will, if well stowed with a mixed Colombo cargo, carry a little over her dead-weight capacity. When stowing *coffee* in ships with 16 or 17 feet depth of hold, a ground tier of cocoa-nut oil should be avoided, or there will be considerable loss of space in the heights of coffee; but ships of 17 feet 8 or 9 inches, or over, will stow coffee to advantage by taking one tier of oil in the bottom. No master should engage *deer horns* unless he is allowed to cut the bundles when on board for use as broken stowage; the bills of lading should state "not accountable for horns cut or broken; all on board to be delivered." Never engage horns for two separate

merchants. Ships arriving off Colombo are generally boarded by a pilot, who places in the masters hands a paper headed "Port Regulations," in which the port captain recommends the use of iron pins for the chain shackles clinched at each end. This recommendation I followed for one or two voyages, but each time my chains became unshackled. I therefore recommend pins made of hard wood, with an iron scupper-nail drove in over each end; this plan was adopted on my last voyage there and found to be a safe one, as I rode out the whole of the south-west monsoon season without accident to the shackles or pins.

883. POISONOUS SUBSTANCES; common articles of freight:

Acids, muriatic.	Nitrates of potash and soda.
,, nitric.	Orpiment, sulphuret of arsenic or
,, oxalic.	Phosphorus. [king's yellow.
,, sulphuric.	Prussiate of potash.
Ammonia.	Realgar, red arsenic.
Arsenious acid or white arsenic.	Spanish flies.
Brunswick green.	Sugar of lead, or acetate of lead.
Chloride of lime.	Sulphate of copper, or blue vitriol.
Corrosive sublimate.	Sulphate of iron, or green vitriol.
Cinnabar.	Sulphate of zinc, or white vitriol.
Ceruse, or dry white lead.	Verdigris.
Iodine.	Vermilion.
Nux vomica.	Vitriol, oil of, or sulphuric acid.

884. POONAC OR POONACK, is cocoa-nut oilcake, and is used in Colombo to feed horses, &c. It is somewhat similar to linseed cake, and is seldom imported into Great Britain. Two casks of poonac transhipped at the Cape of Good Hope, in October, 1869, on board the Union Co.'s mail steamer *Cambrian*, measured $33 \times 21 \times 21$ inches, and weighed 2 cwt. 2 qrs. 11 lbs., and 2 cwt. 0 qrs. 23 lbs. gross; probably they weighed heavier at the original port of shipment.

885. PORT OF CALL. Ports of Call are ports at which a charterer requires that a vessel shall call for the purpose of receiving orders for the discharge of cargo at the port for which she is finally destined. The custom has much increased of late years to direct great numbers of vessels, especially those which are grain-laden, to a port of call in the first place, in order that facilities may be given for the sale and resale of cargoes at any market in the United Kingdom or the Continent which may offer the greatest advantages up to the latest period. This custom is fast extending, but is now chiefly practised in the grain, seed, and sugar trades. Those engaged in any particular trade generally agree on a form of charter-party

which may be best suited to the peculiar circumstances of the case, the most convenient ports of call are Queenstown, Falmouth, and Plymouth. Masters of vessels will do well to be careful that all *three* of these ports are included in their charter-party as ports of call. If Plymouth, for example, be omitted, and the vessel be by accident driven past Falmouth, in case the markets are not favourable the consignees would, and do, cause the masters to go to Falmouth, or to sacrifice a few days by giving more "lay-days," in order to gain time (see *ADAMS v. ANSALDO* in the article grain). The custom of causing vessels to call at ports for orders has given rise to the insertion of an increased number of lay-days in the charter-party. The lay-days usually commence to run when vessels are at ports of call, from the time of the return of post from the consignees (usually London) after the arrival of the vessel. The consignees are however invariably advised by telegraph. They employ at the ports of call agents who are skilled in the art of examining a cargo and reporting on its condition. The master should require from the agent, who presents himself for the purpose of examining a cargo, a written order from the consignees. He should offer every facility for the examination of the cargo throughout, and render all the assistance that he can, as the loss of a post or train may cost him many day's delay. He should call the particular attention of the agent to the state of the hatches before they are removed, and if circumstances render it necessary he should have the hatches surveyed by a professional surveyor. The lay-days run until the day on which orders to proceed to port of discharge are delivered to the master, or on board his vessel; and the days are reckoned from 12 o'clock at night, as the days of the month. It would be well for masters to ascertain at their port of loading to whom the cargo will be consigned, as delay is sometimes caused at the port of call by their being unable to name the consignees. There are also ports of call on an outward voyage to which the masters of vessels are directed by charter-party to proceed for the purpose of receiving orders as to the loading port.

886. POTASH is a salt or alkali obtained from vegetable substances by burning them. Pearlash is potash burnt red hot; see ashes. New York ton 20 cwt., a barrel 200 lbs., a last 12 barrels.

887. POTATOES stowed in bulk require great care, the hold ventholes should be freed, and, when practicable, either the fore or after hatchways should be kept open; this applies more especially to vessels constantly in the trade, as the vapour is very injurious to

the ceiling, timbers, and decks. Where potatoes have been carried in the fore hold of a schooner, the vapour has been known, after a few days, to pass through to the main and after holds, although protected by bulkheads, and to damage other goods in a general cargo. Potatoes of different kinds are often separated in the hold by temporary bulkheads. Those have occasionally given way, when the entire contents of one compartment have been first discharged, to the imminent risk of those employed in that compartment. If such a dangerous course is unavoidable, sufficiently strong supports should be fitted against the bulkheads as the unloading progresses. Barrels of potatoes are sometimes perforated with holes to admit air and let out water in case the barrels should get wet. For the West Indies they are usually packed in baskets containing $\frac{1}{4}$ cwt. each.

888. Potatoes are liable to lose weight between the time of shipment and of discharge, and masters should, when chartering, prepare for that contingency. Much of the earth and dirt about the roots when shipped, falls off before delivery. Potatoes (new especially) generally become dryer in the hold, and consequently lighter than when received. Between Taranaki, New Zealand, and Sydney, New South Wales, the difference has amounted to 10 $\frac{1}{2}$ cent. In May, 1861, a master signed in France bills of lading for 100,000 kilogrammes, or 98 tons 10 cwt. He delivered at Cardiff 96 tons 7 cwt. The merchant claimed £9 for short delivery. In the same month a master shipped in Scotland 104 tons 14 cwt. and delivered in England 98 tons 1 cwt. including 3 tons of bad potatoes. In this case the consignee is only bound to pay freight on the quantity delivered, and the ship is responsible for any of the deficiency (6 tons 13 cwt.) not accounted for. New Brunswick, the bushel 63 lbs., turnips 66 lbs.

889. **Preservation.** Mr. GILBERT SMITH, master of the barque *Martha Wenzell*, of Boston, states that in preserving potatoes from the usual rot at sea, he simply puts them into a berth or pen in a room in the house on deck, generally called the carpenter's room in the forward house, next to the galley. The door to the room is always kept open in fine weather. When putting them into the room or pen, one quart of fine air-slaked lime is thrown over every 25 bushels. Pick them over once in the course of a month, and rub off the sprouts. Potatoes put up in the manner described will keep good five or six months. Capt. SMITH says, "I have now potatoes on board taken in at Melbourne 20th January. The vessel has been to Callao and the Chinchas, and is within a very few days' sail of Mauritius, 1st August, 1861, consequently they have been on board,

and in daily use, six months and ten days, and are as good now as when received at Melbourne. Last voyage we took our sea stock at Talcahuano, Chili, 10th March, arrived in London 5th July, and we sold to one of the dock labourers three bushels for family use. Potatoes add much to the health of the crew at sea, and they are more active with a liberal supply of vegetable food ;" see scurvy.

890. **Accident.** Court of Exchequer, *PURCELL v. BESFORD*, December, 1859. Mr. ROBINSON was for plaintiff: Mr. O'MALLEY, Q.C. and Mr. COUCH, for defendant. This action was to recover compensation for an injury plaintiff sustained by a sack of potatoes falling on him when working in the hold of defendant's ship. Plaintiff was in the service of Messrs. GREGORY and TODD, potato salesmen in Tooley Street, and went by their orders to discharge the *Martha* from Yarmouth. Plaintiff was one of two men employed in the hold filling sacks, and when filled they were hauled up to the deck by a rope with a noose at the end, technically called a "snorter." Plaintiff had put his snorter round a sack, and when it had ascended some distance, he was stooping to pick up an empty sack when his fellow labourer's snorter broke, and the sack of potatoes fell from a height of nine or ten feet across plaintiff's loins, knocked him down, and rendered him insensible. He was taken to Guy's Hospital, where he remained four months, and when discharged was obliged to become an inmate of an infirmary four months longer, and had to return to Guy's Hospital. Plaintiff was not recovered, and hobbled into court on crutches. Two or three witnesses were called for the plaintiff, among whom was a man named JONES, a fruit meter, employed for the Corporation of London, and who swore that, as well as looking to the measuring, it was a part of his duty to see that the tackle or gear employed was in proper and secure working order; and that seeing the snorter about to be used would not do, he pointed it out to the mate and requested him to get a new piece of rope, which he declined doing, but fetched an old piece and manufactured the one that afterwards proved the cause of so much mischief. For the defence it was said that plaintiff was guilty of great negligence in being in the position he was when the accident happened, as he ought to have stood aside until the sack had reached the deck. The mate swore that the rope he used was fit and proper for the purpose, and contradicted the evidence of JONES. Verdict for plaintiff, damages £100.

Tonnage, &c. 17 tons potatoes in bulk occupy 850 cubic feet or one keel. The Admiralty allows 13 cases preserved potatoes of one cwt. to a ton: and 22 cases half cwt. to a ton; at Greenock 13½ barrels make a ton. A barrel of potatoes about 200 lbs.; 10 bushels usually go to a ton: a Jersey cabot 40 Jersey pounds; 13 lbs. local, 14 English; United States bushel 56 to 60 lbs.; sweet potatoes 50 lbs. When wheat is 1s. ½ quarter freight, potatoes should be 5s. 8½d. ½ ton.

891. **PRESERVED MEATS.** 150 tons taken in at Melbourne in August, 1869, by the ship *Norfolk*, Capt. B. TONKIN, and discharged in London in October, 1869, were stowed (with general cargo) abreast of the main and after hatchways. They were packed in 2,000 cases made of common deal and native wood, each containing twelve 6 lb. tins, preserved in the usual way, and 143 casks fresh or

lightly-cured beef and mutton filled in with hot tallow. The cases and casks measured about 50 cubic feet to the ton weight.

892. PRIMAGE is a per centage that was formerly paid to the master as a gratuity for taking care of the shipper's goods ; it has, however, long since been included in the freight.

893. PROTEST AND SURVEY. In all cases and within 24 hours of a ship's arrival at her port of destination (or any other to which she may have been driven for repair of damage from stress of weather, &c.), the master should go to a notary public, or in a foreign port to the British consul, and note a protest against wind and weather, as the term is.

894. Extension of the Protest, whether necessary from damage to the ship, or cargo, or other causes, must, to be valid, be effected within six months of the "noting." The "ship's log," kept and written daily by the chief mate, and signed by himself and the master, becomes of the first importance, as the statements contained therein are the foundation of the document. It should describe most particularly the state of the wind and weather, and the effects on the ship as regards any accidents which may have arisen from its violence, the amount of damage sustained, and the cause to which it may be attributed, as far as can be ascertained at the time ; also, the time of occurrence, latitude and longitude, the attention given to the pumps, &c. All interlineations and erasures should be avoided, and if any correction is necessary while writing, it should be effected by drawing the pen through the error. The extended protest being prepared, the master, chief, and one other officer, usually the carpenter, or failing these, two of the crew, proceed before the notary, who reads over the document, which being found correct, is sworn to and signed by them ; it is then available for legal purposes.

895. The practice differs in foreign ports, for instance : a British ship from Peru, with a cargo owned and shipped by, and consigned to, Genoese merchants, arrived in **Genoa** ; the master was requested to protest, through a Genoese notary, who accordingly received the log-book for the purpose, and, in addition to the master, examined two of the crew privately and separately, on the statements therein. It will thus be seen how important it is that the log-book should be kept correctly. At **Marseilles**, when it becomes necessary to submit log-books to the authorities, the ship's officer must sign the page where the writing ends, to prevent any additions after arrival. It is, therefore, requisite that the log-book should be properly written up before arrival, and ready to be produced when asked for, as in

case of damage to ship or cargo, serious difficulties may be otherwise experienced in the settlement of average.

896. There are other important matters in which a master may require to protest ; as when a vessel has arrived at her loading port, and the merchants who covenanted, say by charter, to furnish a lading, are unwilling or unable to do so. In this case, lay a reasonable time, give a notice in writing, before a witness, and note a protest against the merchants for non-fulfilment of the charter-party, after which a master is at liberty to seek a freight in another direction, and can claim compensation for loss of time, as well as any loss arising from his being obliged to accept a less remunerative freight than stipulated for originally. It is improper to wait the *demurrage* days, unless required to do so by the merchant. In the event of a ship performing all her engagements under the charter, and at the expiration of the demurrage days, getting no cargo, she proceeds to the port she should have discharged at, she would be entitled to her freight or the penalty usually inserted in charter-parties ; in this case the stability of the charterers should be considered.

897. **Surveys.** In surveying a cargo, merchants or produce brokers acquainted with its nature, should be employed, and when the same is in a ship, it is advisable to have at least one master or other nautical person, not parties interested, on the survey, which should be held on the goods before being "broken out" or moved from their stowage. The master or some person on his behalf, should be present. In the London docks, the company's surveyor attends constantly to these duties while the ship is discharging. The nature of the damage, whether arising from improper stowage, fresh or salt water, or other causes, as nearly as can be ascertained, should be stated in the "report of survey," which should also particularize the goods, mentioning their marks and numbers, the thickness of the dunnage, and any other matters which, in the opinion of the surveyors, may be necessary ; and being signed, should be given to the parties calling the survey. While opening the hatches, some masters have them surveyed to see they were properly secured, and to guard against a charge of neglect in the event of damage ; for closing hatches see mate.

898. In surveying damage done to a ship, two masters, or in their absence, any two qualified persons, should be employed ; it is not necessary in any case to call LLOYD'S agents, but having great experience they are frequently employed. The surveyors should state in their report the particulars of the damage as full as possible ; in the event of the damage being repaired, the same surveyors

should be called to report on the repairs executed. See also the recommendations by the Sunderland Association, in the article *masters*.

899. PROVISIONS. *Wet* provisions are beef, pork, suet, vinegar, rum, and limejuice ; *dry* provisions are peas, oatmeal, chocolate, tea, flour, raisins, and sugar. Wet provisions should be always kept together, and, as a rule, are generally stowed nearest amidships, because they are heavier than dry provisions. As *cargo*, barrels of provisions are allowed to stow six heights. Some recommend that beef for *ship's use* should go on the starboard side, and pork on the port, if both are in packages of the same size, while others object to it as involving the necessity of breaking out and re-stowing both sides instead of one, every time provisions are required. When they are in casks of the same size, and are mixed, it may be convenient to mark each plainly B or P on the head, with white paint or chalk, or on the bilge close to the bungs, as they are stowed, it being difficult to make out the brands after they have been some time in the hold without removing them. This marking might be done by the provision dealer prior to shipment, and is more particularly of consequence if the bung is not turned over, through the liability of the stevedores stowing some of the homeward-bound stock in the after run, bung downward. Leakage ensues, and the chances are that the meat is discoloured, if not unfit for use at a time when no further supply can be obtained. Mr. GRANGE says, "dry provisions should be put up in air-tight casks, and well coopered with iron hoops, and tightened every three months. The tea in light iron or tin cases ; Cuba, or Brazilian sugar and coffee, in cases in which they are imported ; limejuice in stone jars, each to contain no more than a fortnight's consumption. Salted provisions to be well coopered with an extra iron hoop, put on each end and bilge before shipment, and stowed carefully away where there will be no chance of disturbing them, and if moved to be coopered and filled up with pickle. If the voyage exceed 12 or 15 months, they should be fresh pickled at the middle of this time. The bung is usually between the rivets of any two opposite hoops. Casks of provisions, flour, rice, sugar, water, &c., should be noted down in the "hold-book," and, if possible, a plan of this part of the hold should be taken. This precaution is especially applicable to casks of suet, of which there are generally not very many, and therefore the more difficult to be found. Kegs of suet (like kegs of butter) might be stowed by themselves, so as to be more easily found. Raisins and currants should never be placed over water. Flour, suet, and raisins

should be contiguous to each other. Flour and bread should never be stowed in the hold if it can be avoided, as the steam generated there deteriorates them in a very short time. Some recommend beer to be stowed each side of the pump-well. Potatoes, onions, &c., are frequently stowed in the tops when ships are fully laden. An experienced master says, "in passenger ships a place for provisions is always reserved in one of the hatchways, usually the main, and the others are kept well battened down, for if all the hatchways were open, or nearly so, the provisions and cargo in the lower hold would be greatly damaged in heavy weather. It may be argued that when rain prevails all the passengers would be below thoroughly well battened in, but it must not be forgotten that at sea wet weather continues sometimes three parts of the voyage, and that if water once gets down the main-deck hatch, it will be sure to find its level in the bottom of the ship."

900. Another master says, "in passenger ships a portion of the after hold, including the square of the hatchway, is reserved for provisions, and frequently an issuing room is constructed in the 'tween decks which will contain a quantity of *dry* provisions to last several days, and thus avoid the necessity of having the lower after hatchway open every day. The *wet* provisions are more frequently than otherwise in the fore hold with the water. In ships carrying cargo, also, it is considered rather a desideratum to fill the main hold up and caulk the lower main hatches carefully down, well covering and battening. The ship during the passage thus lightens gradually at each end, and carries the bulk of the weight in the long midship section. If it is found that she springs up too much forward, salt water is easily pumped into the empty water casks or tanks. All passenger ships have a strong well fitted and partially glazed booby hatch over the after hatchway on the quarter deck, which not only keeps out rain, but heavy seas. The fore and main hatches are frequently not only fitted in the same manner, but have also a stout spar about seven feet above the level of the deck, fore and aft over the centre of the upper hatch, and a strong *painted canvas* cover, stretched tentwise over the spar, down to the combings on each side, so that if water should get below and cause inconvenience, or damage provisions, it must be through gross carelessness or neglect."

901. In the Royal Navy masters are instructed to stow old provisions so that they may be first expended, and on receiving subsequent supplies, they are to place the new under the old. Lieut. ALSTON, R.N., says, in the after hold (of a ship of war) stow the wet provisions as ground tiers, and the dry provisions on the top; beef

and flour starboard side, pork and peas port side. Remainder of provisions together in the after part or interspersed where they best cut in—keeping the oldest uppermost in all cases. All casks are stowed fore and aft, except in broken stowage, when they must be placed with chief regard to economy of space. Firewood is used for dunnage, mixed among the casks in quantity proportionate to the consumption of provisions. As the salt provisions are buried under the dry, an additional quantity of the former are stowed in the square of the hatchway, to last until you break down to the foremast longer, when you can work your way along evenly.

902. **Dry Beef.** The brigantine *Rudolph*, Capt. MENKE, of Papenburg, 60 lasts commercial, 138 tons, $89 \times 22 \times 11$ feet English, took in at the River Plate, July, 1865, for conveyance to the Brazils, about 5,500 quintals of dried beef—a quintal is 100 lbs. Spanish. Worms from this cargo entered the bread, beans, and other dry provisions in the ship. Capt. MENKE says, that unless the hold is well cleansed and purified after carrying dried beef, the ship is unfit to receive coffee, flour, bread, sugar, or any other edible goods. He considers that insects are also generated by cargoes of bones and bone-ash, and that bone-ash when wetted, is very injurious to the interior wood-work. The *Rudolph* with 225 tons of coal shipped at Dysart, near Leith, drew aft 12 feet, forward 10 feet; with 1,820 barrels flour shipped at Trieste, which filled the hold, 11 and $10\frac{1}{4}$ feet; and with 2,700 bags of coffee shipped at Rio, each bag containing 112 lbs., 11 and 10 feet. When loading dried beef in the River Plate, it is usual to cover the entire hold with straw, supplied by the merchant or charterer.

903. In the supply of butter to Emigrant Ships, the Government requires for every firkin of 75 lbs. an additional quantity of 5 lbs. to make up weight. Six bottles of stout are considered equal to one gallon; bag of bread 112 lbs.; tierce beef 336 lbs., in 42 pieces of 8 lbs.; pork, India, 318 lbs., 53 pieces of 6 lbs.; barrel of pork, mess, 200 lbs., 50 pieces of 4 lbs.; cask flour 196 lbs.; raisins, box, 56 lbs., half-box 28 lbs.; case preserved potatoes 112 lbs.; fathom fire-wood 630 lbs. All provisions and stores under hatches; never more than two tons water on deck. Where fresh beef is served out in harbour, it is customary to give men the option of taking a loaf of bread and 1 lb. vegetables each, in lieu of half a pound of meat. A United States barrel of pork weighs 200 lbs., beef 200 lbs., a tierce of beef 303 lbs.

904. **Lime Juice.** Dr. DICKSON, in writing to the Board of Trade, December 8th, 1864, says, “so much depends on the manner of

preserving this important article of seamen's diet, that I would beg most respectfully to call their lordships' attention to the plan resorted to in the Royal Navy. The lemon juice is prepared in Sicily, and about a tenth of spirit is added. It is preserved in bottles containing about three imperial pints, and in no other method is it issued even to the largest ships, where the consumption on long voyages is necessarily very great. Experience has proved the excellence of this article, for it rarely spoils, even after several years, and scurvy has long been unknown in Her Majesty's service." Mr. HARRY LEACH, surgeon of the *Dreadnought*, in his *Medical Guide* recommends that for ten men there should be served out at dinner daily half a pint (10 ozs.) lime juice, six pints water, and 10 ozs. sugar.

Tonnage. 110 tierces beef, 3 cwt. each, weighing $16\frac{1}{2}$ tons; or 156 barrels pork, 2 cwt. each, $15\frac{1}{2}$ tons, will occupy a space of 850 cubic feet or 1 keel. Six tierces or eight barrels of Irish beef or pork are shipped as a ton; either quantity will weigh about 24 cwt. E. I. Co. six tierces to a ton. New York 6 barrels, each 200 lbs. Baltimore 6 barrels beef or pork, 7 barrels naval stores. When wheat is freighted at 1s. $\frac{1}{4}$ quarter, beef is rated at $10\frac{1}{2}$ d. $\frac{1}{4}$ tierce, and pork $7\frac{1}{2}$ d. $\frac{1}{4}$ barrel.

905. **PUMPS.** The heels ought not to be placed over a seam in the planking, but if this occurs, a plate of copper should be fixed so as to prevent the oakum from being drawn out. In 1847, the *Sebonheath*, from India, sprung a leak suddenly, and was compelled to put into St. Helena, and "heave down," when it was found that the oakum in the seams under the pumps had been drawn out by suction. It is desirable that the pump-well should be large enough to admit of access to the heels of the pumps, for the purpose of clearing them of dirt; see mate, tar, &c.

906. **PUREE.** Bombay ton 8 cwt.

907. **PUTCHUCK.** Bengal and Madras ton 10 cwt.

908. **QUARANTINE.** A list of goods and articles considered by the Customs' authorities as most liable to infection; apparel of all kinds, artificial flowers, bast (a rush) or any article made thereof, beads, bracelets, or necklaces in string, beds and bed ticks, books, brooms of all kinds, brushes of all sorts, burdets, camlets, canvas, carmenia wood, carpets, cordage not tarred, cotton wool, cotton yarn, cotton thread, all articles made wholly of or mixed with cotton, silk, wool, thread, or yarn, down, feathers, flax, furriers' waste, goats' hair, gold or silver or thread, cotton, hair, wool, or silk, or any other substance hereinbefore mentioned, grogam, hats, caps, or bonnets of straw, chip, cane, or any other material, hemp, hoofs, horn tips, hair of all sorts, leather, linen, lute strings, lathing, or

harp strings, maps, mattresses, mats and matting, mohair yarn, nets, new or old, packthread, paper, parchment, pelts, plaiting of best chip, cane, straw, or horse hair, quills, rags, sails, and sail cloths, silk, viz. : crapes and tiffanies, husks and knubs, raw silk, thrown and organizing silk, waste silk, wrought silk, skins, hides, and furs, and parts or pieces of skins, hides, and furs, whether undressed or in part or wholly tanned, tawed, or dressed, sponges, straw, or any article made or mixed with straw, stockings, of all sorts, thread, tow, or vellum, whisks, wool, whether raw or anywise wrought, yarn of all sorts, and all other goods whatsoever if they shall have arrived in or with packages consisting wholly or in part of any of the said articles. At **Philadelphia, U.S.**, no vessel laden wholly or in part with vegetables, fish, or hides, arriving between 1st June and 1st October, is permitted to unload without a permit from the Board of Health ; penalty \$500.

909. QUERCITRON, the bark of a species of oak tree, abundant in North Carolina, U.S. ; it is the *quercus tinctoria* of Linnæus, and the bark is used for dyeing olives, drabs, and yellows. It is also valuable for dressing hides, but not much used in England for that purpose. It probably contains more tannin than any other description of oak bark ; it is of course necessary to prevent water from coming in contact with it, as its valuable principle is soluble in water. Hamburg tares : Philadelphia, New York, and Baltimore quercitron 10 ¢ cent.

910. QUICKSILVER or mercury is an imperfect metal resembling melted silver ; it is the heaviest of all fluids, and is found in Germany, Hungary, Italy, Spain, and South America. It is usually contained in wrought-iron bottles, weighing 84 lbs. net. A flask in California 75 lbs.

911. RAGS AND SHODDY. Rags, particularly when unwashed, should not be stowed near oil, linseed oil especially, or turpentine, or spontaneous combustion may ensue ; when subjected to heavy pressure the liability is increased. In July, 1864, while the hands were discharging the cargo from the steam-ship *Pollux*, Capt. WITT, from Hamburg, lying in the river off St. George's Stairs, Horsley-down, a bale of rags in the main hold was found on fire ; they had ignited spontaneously, and had evidently been burning several days. The bale was soon got on deck ; no damage was done to any other portion of the cargo. The screw steamer *Gitana* left Hamburg 20th May, 1865, with a number of passengers and a general cargo, among which was a quantity of shoddy ; she had not been out many

hours before the cargo was discovered on fire. The passengers were not then made aware of the fact, for fear of unnecessary alarm, but every exertion was used by the master and the crew to stop its progress. Orders were given to put on all steam, and make for West Hartlepool. Smoke was issuing through the crevices on deck, and into the fore cabin—the cargo being stowed in the fore hold. All vents where air might be able to enter were covered. During the whole of the next day the evidences of the fire were still perceptible, but it had apparently made little progress; the passengers were therefore not apprehensive of serious consequences. West Hartlepool was at last reached, and the vessel steamed up to the wharf; the floating fire engine was immediately brought near; hatches were opened; the smoke that first issued was immense; but the hoses were put into full play, and kept up a continual stream until the fire was subdued. The damage was unimportant. In August, 1865, a fire commenced on board the steam-ship *Albert*, in Prince's dock, Hull, through the spontaneous ignition of some bales of shoddy, part of her cargo, but was soon extinguished. Rags are not included in the London and Baltic proportionate rates of freight. London brokers allege that they will stow more advantageously than flax, which is in the table of rates. Memel exports by far the largest quantity from the Baltic, and also considerable quantities of flax. The principal sworn brokers there aver that rags stow 7½ to 8 ¢ cent. better than flax; it is therefore usual with London brokers to charter ships on this side at a difference of 5s. less for rags than for flax. In opposition to this arrangement a Leith owner stated 25th May, 1864, that his ship registers 192 tons and discharged 161 tons of rags, whereas she would have loaded at least 15 tons more had she had a cargo of flax. Rags are sometimes freighted at the same rate as bark. A bag of Hamburg weighs 2½ cwt.; a bale of Mediterranean 4½ to 5 cwt. Shoddy is wool produced by tearing up woollen rags by machinery. It is re-spun and used for carpets and low-class goods. The machine used for tearing up the rags is called a "devil," and the dust that comes from the rags while being torn up is called "devil's dust."

912. RATTANS; see dunnage and whangees. Bombay ton 16 cwt. in bundles, whangees and canes; 16 cwt. ground; Bengal and Madras 20 cwt. for dunnage. There are usually 100 canes in a bundle of rattans.

913. Although shipped at different ports at various rates of freight, according to the requirements for dunnage, &c., it occurs that ships are chartered with rattans alone for conveyance to the

United States and elsewhere. From Singapore 10,000 to 15,000 tons are shipped annually (1870) to the states by one American firm. Masters should be careful in chartering for a "*lump sum*" to stipulate for such a quantity of stiffening to be supplied by charterer as may be considered requisite to make the ship seaworthy; Banca tin in quantity is desirable, and should of course be put in first, a portion being kept in the 'tween decks or elsewhere to stow towards or at either end of the ship to trim with. If there should be any question as to the stability of the vessel and the quantity of ballast required, a fair-sized trunkway should be kept under the square of the main hatch, so that dead-weight cargo or ballast may be put in—no positive rule can be given as a guide on that point. When laying in an open anchorage, with occasional beam winds, it would be advisable to set sail with the yards braced, and fore and aft canvas well set, and note the number of degrees of "heel" that the vessel may take, observing carefully that she does not start her anchors.

914. RECEIPTS FOR GOODS. The question regarding receipts for goods was, as between French docks and railways, decided in the affirmative by the Tribunal of Commerce of the Seine, 31st October, 1862. The Orleans Railway Company were plaintiffs, and the Docks Napoleon Company defendants. The question at issue was an important one for railway companies, which are in the habit of depositing large quantities of goods at the docks on account of owners who do not wish to pay the duties until they have sold the merchandize. The companies have, therefore, an interest in obtaining a receipt from the docks, stating the exact weight of the merchandize when delivered, in order that they may not be rendered liable for any deficiency found at a future time when the goods should be weighed for payment of duty; such receipts the Dock Company had constantly refused, and hence the present action. On the 4th September the Orleans Company deposited at the docks 270 bags of raw coffee, the weight of which, as announced in the invoice, was 20,999 kilogrammes. The Railway Company demanded that the coffee should be immediately weighed and a receipt given accordingly, but the application was refused. The tribunal after hearing counsel on both sides, gave judgment for plaintiffs, in which it is stated that the Dock Company were wrong in refusing to give a receipt for the exact weight of the merchandize on delivery, that it should consequently be responsible for any deficiency in the weight of 20,999 kilogrammes; and that for the future it should be bound to weigh immediately all goods deposited with it by the Orleans Company, and give a receipt accordingly. Defendants paid costs.

915. RED EARTH. Bombay ton 20 cwt.

916. REDWOOD is usually in junks, three or four feet long by two inches thick. It is shipped all the year round, and makes capital dunnage for the wings, for the cantlines of casks, &c. ; it is considered by some masters as crooked, ugly stuff, occupying much valuable space ; the smallest of it is said to dunnage a ship more than is necessary for the preservation of cargo. Where dunnage is cheap it is recommended to refuse redwood unless a fair freight is paid, especially when other rates are fair. As broken stowage, being heavy, it makes some ships tender at sea ; see dunnage. Bengal and Madras ton 20 cwt. for dunnage ; Bombay 16 cwt.

917. REGULUS was given as a name by chemists to metallic matters, when separated from other substances by fusion. It was afterwards applied to the metal extracted from the ores of the semi-metals which formerly bore the name that is now given to the semi-metals themselves. In other words, it is copper ore which has been once through the fire. On the West Coast of South America it is usually shipped in bulk. In South Africa it is shipped in bags. Being heavier, it requires a platform higher than that used for copper ore ; see ores. Regulus at Adelaide is calculated at above 25 $\frac{1}{2}$ cent. heavier than copper ore ; it is usually shipped thence in beer hogs-heads, containing about 14 $\frac{1}{4}$ cwt. each, or in bags at 56 lbs. in each.

918. RESPONSIBILITY. The custom and usage of the port will, in a great degree, regulate the mode of loading ships, when there is no express condition to the contrary ; but masters, being under the same penalties as common carriers, are nevertheless bound to place the goods in position so that they will be unlikely to injure each other, to keep them in safe custody, and to deliver them in good condition to the legal owner of the bill of lading. It therefore follows that if goods liable to leak are placed over bale goods, or if a cask be stove when letting it down in the hold, the master is liable. Irrespective of the legal responsibilities, it is well known that shippers at home and abroad, when aware that their cargoes will be stowed properly, will give a preference, and at higher rates, to those masters, British or Foreign, who undertake to guarantee the dunnage, &c. ; see the letter of Mr. MORGAN, consul at Bahia, in the article coal.

919. Lord Chief Justice TENTERDEN says (in reference to responsibility) : the disposal of the cargo by the master is a matter that requires the utmost caution. He should always bear in mind that it is his *duty to convey it to the place of destination*. This is the purpose for which he has been entrusted with it, and this purpose he is bound

to accomplish by every reasonable and practical method. What then is the master to do, if by any disaster happening in the course of his voyage, he is unable to carry the goods to the place of destination, or to deliver them there? To this, as a general question, I apprehend no answer can be given; every case must depend upon its own peculiar circumstances. The conduct proper to be adopted with respect to perishable goods will be improper with respect to a cargo not perishable: one thing may be fit to be done with fish or fruit, and another with timber or iron: one method may be proper in distant regions, another in the vicinity of the merchant—one in a frequented navigation, another on unfrequented shores.

920. The wreck of the ship is not necessarily followed by an impossibility of sending the goods forward; it does not, of itself, make their sale a measure of necessity or experience: much less can the loss of the season, or of the proper course of the voyage, have this effect. An unexpected interdiction of commerce, or a sudden war, may defeat the adventure and oblige the ship to stop in her course; but neither of these events doth, of itself alone, make it necessary to sell the cargo at the place to which it may be proper for the ship to resort. In these, and many other cases, the master may be discharged of his obligation to deliver the cargo at the place of destination; but it does not therefore follow that he is authorized to sell it, or ought to do so. What then is he to do? In general it may be said *he is to do that which a wise and prudent man will think most conducive for the benefit of all concerned*. In so doing he may expect to be saved, because the merchant will not have reason to be dissatisfied: but what this thing will be, no general rules can teach.

921. Some regard may be allowed to the interest of the ship and of its owners; but the interest of the cargo must not be sacrificed to it. Transhipment for the place of destination, if it be practicable, is the first object, because that is in furtherance of the original purpose: if that be impracticable, return, or a safe deposit, may be expedient. A disadvantageous sale (and almost every sale by the master will be disadvantageous) is the last thing he should think of, because he can only be justified by that necessity which supersedes all human laws.

922. Lord CAMPBELL gave a very important opinion in the Court of Queen's Bench, in May, 1856, regarding the liability of owners to deliver goods in good order.

GILLESPIE v. THOMPSON. This was an action brought to recover damages resulting by the alleged bad stowage of flour on a voyage from New York to Liverpool. The question came before the court under the provisions of 15 and 16 Vic., cap. 16, sec. 46. In the month of April, 1854, plaintiffs, who are

merchants in New York, shipped in good order and condition on board the American ship *Star of the West*, of which defendants were then owners, then lying in that port, and bound for Liverpool, 1,526 barrels of flour, for which a bill of lading was signed by the master in the ordinary form. She had a miscellaneous cargo, consisting of

2,150	Barrels flour,	250	Barrels spirits turpentine,
600	Bales cotton,	57	Puncheons turpentine,
800	Tierces lard,	3,600	Barrels tar,
100	Hogsheads tallow,		And some other articles.

Vessels from New York bring very miscellaneous cargoes, and flour and turpentine are sometimes brought in the same ship, but the plaintiffs, when they shipped the flour, had no notice and were not aware that turpentine was or would be shipped. On arrival in Liverpool it was discovered that the flour was tainted by turpentine, and under the advice of competent brokers, the flour was sold by auction, and produced £196 16s. 10d. less than its sound value. The damage had not resulted from sea damage, but it was caused by the fumes arising from the turpentine having reached and tainted the flour. The damage did not result from any direct contact between the flour and the turpentine, for both were properly stowed and dunnaged, and care was taken to separate them from each other, and save in so far as it may be considered improper in any case to place flour and turpentine in the same vessel, there was no negligence or want of due care on the part of the owners, or master, in the stowage in question. Although flour and turpentine are sometimes shipped in the same hold, it is the fact that flour carried with turpentine, has in many instances, received more or less damage from it; and plaintiffs contended that it is improper stowage to place articles in a vessel's hold, so that the presence of one may damage another, and that as the damage in this case was not the result of the peril of the sea, the shipowner is bound to make good the loss. The question for the opinion of the court was, whether defendants were liable for the damage sustained under the circumstances. If the court should be of opinion that they were so liable, judgment of *nil dicit* was to be entered for plaintiffs for £196 16s. 10d. If the court should be of a contrary opinion, their judgment of *nolle prosequi* is to be entered.

Lord CAMPBELL : The opinion of the court is that the owners took the goods in good order and condition, and undertook that they should be so delivered, the dangers of the sea excepted; they were delivered in bad order and condition, being greatly deteriorated by the turpentine, that does not come within any express or implied exception; we think it has resulted from bad stowage which has produced this effect. There is no doubt the owner of the ship is liable. Mr. MANISTY : I hope your lordship will say it is a fair case in which we should not bear the cost. Lord CAMPBELL : I think it a case in which the cost unquestionably ought to follow the event. You must take it as if you had proceeded and submitted everything that you thought proper for and required the deliberation of the court. See transhipment.

923. RETORTS (clay) should be stowed in the hatchways or in the ends of the ship on the top of the cargo, care being taken to make a level bottom; not more than four tiers. They are in pieces 3 to 10 feet long, 14 to 20 inches diameter, and weigh 6 to 16 cwt. each.

924. RHEA. Bengal and Madras ton 50 cubic feet in bales.

925. RHUBARB, the root of a plant which grows wild in Turkey, Asia, &c. It should be kept perfectly dry. Bombay ton 50 cubic feet in cases. A box containing half a pecul of Chinese measures 3,333 cubic feet; 15 boxes or 8 parcel boxes go to a ton of 50 cubic feet.

926. RICE. Very little comparatively is grown on dry soils; that cultivated on the hills is usually small and remarkably crisp. Most descriptions require a moist soil; in some parts the stalks are kept under water until the grain is ripe. **East India** rice is often mouldy when first shipped, in consequence of the wetness of the seasons. At Moulmein, although in appearance perfectly dry when brought by the country carts, and quite cool in the heap, yet after being packed in gunny bags, and stowed in a ship's hold, it becomes so hot that the air which rises through the vacancies round the stanchions, &c., is described as being similar to that of an oven. This air ascends like steam, and striking underneath the cold decks, when the hatches are closed, condenses speedily, especially in the hatchways, and drops on goods below, thereby frequently causing damage; sometimes the bags containing rice immediately under the hatches, are quite rotten on arrival at the port of discharge. The steam is also highly injurious to the paint-work, and often detrimental to the health of the crew; cargoes in a hot state, injure the ceiling, decks, and timbers of ships. Ventilation is absolutely necessary. Rice shipped at Akyab, Rangoon, and Bassein, becomes heated in the same manner as that from Moulmein. In India, speaking generally, two crops of flooded rice are obtained annually; the first is cut in February and March, the second is reaped in October. The earlier one is by far the more valuable. In Ceylon, rice is usually sown in July and August, and reaped in February, but there is not sufficient grown on the island for the consumption of the inhabitants, who are therefore obliged to import. In Sumatra, the rainy season is from about November towards the close of February; the **harvest** occurs in April.

927. There is considerable difference in the weight of rice, especially as between what is termed clean rice and **paddy** (rice in the husk), which is lighter. An ordinary ship cannot take a full cargo of clean rice; with about eight $\frac{1}{2}$ cent. of paddy she may be filled "chock up." An iron ship of 853 tons register, from Rangoon, delivered in Liverpool 558 tons of rice, of the usual quality, and 557 tons of paddy, and yet was not "chock full." Wooden ships of

No.	Name	Age	Sex	Religion	Occupation
1	John Smith	25	M	Anglican	Farmer
2	Mary Jones	22	F	Anglican	Housewife
3	James Brown	30	M	Anglican	Blacksmith
4	Elizabeth White	28	F	Anglican	Teacher
5	Robert Green	35	M	Anglican	Merchant
6	Sarah Black	20	F	Anglican	Widow
7	William Grey	40	M	Anglican	Physician
8	Ann Hill	18	F	Anglican	Student
9	Thomas Lee	27	M	Anglican	Lawyer
10	Jane King	24	F	Anglican	Shopkeeper
11	Richard Scott	32	M	Anglican	Engineer
12	Elizabeth Adams	26	F	Anglican	Artist
13	George Baker	38	M	Anglican	Banker
14	Frances Clark	21	F	Anglican	Musician
15	Henry Evans	45	M	Anglican	Writer
16	Charlotte Hall	19	F	Anglican	Actress
17	John Wilson	33	M	Anglican	Scientist
18	Margaret Young	23	F	Anglican	Journalist
19	Edward King	37	M	Anglican	Historian
20	Anna Lee	25	F	Anglican	Philosopher
21	Robert Hall	31	M	Anglican	Politician
22	Sarah King	27	F	Anglican	Economist
23	William Lee	42	M	Anglican	Historian
24	Elizabeth King	29	F	Anglican	Philosopher
25	Thomas King	36	M	Anglican	Politician
26	Jane King	24	F	Anglican	Economist
27	Richard King	32	M	Anglican	Historian
28	Elizabeth King	26	F	Anglican	Philosopher
29	George King	38	M	Anglican	Politician
30	Frances King	21	F	Anglican	Economist
31	Henry King	45	M	Anglican	Historian
32	Charlotte King	19	F	Anglican	Philosopher
33	John King	33	M	Anglican	Politician
34	Margaret King	23	F	Anglican	Economist
35	Edward King	37	M	Anglican	Historian
36	Anna King	25	F	Anglican	Philosopher
37	Robert King	31	M	Anglican	Politician
38	Sarah King	27	F	Anglican	Economist
39	William King	42	M	Anglican	Historian
40	Elizabeth King	29	F	Anglican	Philosopher
41	Thomas King	36	M	Anglican	Politician
42	Jane King	24	F	Anglican	Economist
43	Richard King	32	M	Anglican	Historian
44	Elizabeth King	26	F	Anglican	Philosopher
45	George King	38	M	Anglican	Politician
46	Frances King	21	F	Anglican	Economist
47	Henry King	45	M	Anglican	Historian
48	Charlotte King	19	F	Anglican	Philosopher
49	John King	33	M	Anglican	Politician
50	Margaret King	23	F	Anglican	Economist

1,000 tons and upwards will, as a rule, carry 25 $\frac{1}{2}$ cent. additional of paddy ; iron ships more. With rice cargoes ballast is unnecessary, but a good depth of dunnage is required and may be used without loss of freight ; if in bags, say 20 inches to 2 feet on the floor, carried well up, and the sides plentifully supplied with bamboos or other similar articles. Mat over all. Quantities of paddy are shipped from ports on the east side of the bay of Bengal, viz. : Akyab, Bassein, Rangoon, and Moulmein. The loss of weight on the passage to Europe was formerly from 10 to 12 $\frac{1}{4}$ per cent. ; now it seldom exceeds five per cent., generally three to four per cent. ; it is greatly increased by the large number of weevils and other insects which infest common dirty rice. The loss on good clean rice is from two to three per cent. An experienced Liverpool firm states that a well ventilated cargo turns out better weight than one not ventilated ; it is, however, difficult to persuade shipmasters so. A ship of 200 tons register was freighted in 1861, at Algoa Bay, to run in ballast to Calcutta, "and there receive from the charterer's agents and load, a full and complete cargo of Bengal produce, not exceeding what she can reasonably stow and carry, and being so loaded shall return therewith to Algoa Bay ; freight to be paid in consideration of the due performance of this agreement by the charterers on unloading and right delivery of the cargo at the rate of 60s. sterling per ton of 20 cwt. net, for weight, and of 50 cubic feet for measurement respectively." On delivery she made out rice 240 tons weight, bales 26 tons measurement. On one occasion she had carried 330 tons weight Indian corn, and on another 100 tons iron, and 350 tons measurement goods. It appears that the rice imported into Algoa Bay is of an inferior sort, and not of the fair quality usually shipped to other ports, which is considered dead-weight, and is nearly so. The *Ravensraig* (see linseed) with 11,000 bags of Calcutta rice, shipped in August, 1863, drew 19 feet 2 inches aft, and 18 feet 9 forward. The rice was discharged at Port Louis, Mauritius, in November, 1863 ; there was no loss by evaporation. Sometimes, merchants there make charges against the ship for what are termed "slack bags," that is, bags not full, on the plea that they were full when shipped. If the master can prove to the contrary, he will resist the demand. Masters should sign bills of lading for the number of bags received supposed to contain rice, and not sign for full bags.

928. At **Calcutta**, with **general cargo**, rice is often injured by black-lead, indigo, and turmeric. Sugar should be well covered with mats to receive rice, which should never be stowed under it. It

readily absorbs ammonia from substances containing it, and should therefore be stowed at a great distance from guano or superphosphate. Rice absorbs moisture, generates heat, and consequently creates leakage, from all liquids near; on discharging a cargo of rice which was stowed on a ground tier of arrack, all the casks were deficient, and some entirely empty. At Calcutta, Akyab, Rangoon, Bassein, Moulmein, Madras, Bombay, and Singapore, rice is packed in bags double and single; the single must be handled with great care or they will burst; latterly, in consequence of the cost of the material, few double bags have been used, except from Calcutta. The exports of rice from Bombay and Singapore are not extensive. At Madras, rice is shipped in surf boats; the loss by damage is from 5 to 15 per cent. Mr. MADDOCK, pilot, says, 1862, "in the **rice season** which commences in December and continues until May, ships often go from Calcutta to Akyab. At the southern ports—Bassein, Rangoon, &c., the shipments begin usually in November, but the best loading months are January, February, March, and part of April, as there is then more freight offering. The first breaking up of the north-east monsoon is generally observed in May, and cargoes loaded later than this, are liable to be more or less injured by rain in the course of shipment. Vessels bound for the Straits and for China occasionally leave as late as July; but as their cargoes are in bulk, and the hatches are removed whenever opportunity offers, there is not much fear of damage. Ships, however, with a cargo so heavy and trying as rice, bound for Europe, should never sail later than April, so as to ensure a safe passage both over the bar and down the bay, before the south-west monsoon attains its full strength; by leaving thus early too, a great saving is effected in the payment of pilot rates and other expenses, both of which are charged much higher as the season advances." The decrease on the voyage to Europe of a cargo of 600 tons of Akyab rice, was at the rate of $4\frac{3}{4}$ % cent., and the tare (single bags) amounted to rather more than six tons. The decrease in weight from Akyab, Rangoon, Bassein, and Moulmein, is generally from 3 to $4\frac{1}{2}$, and from Bengal not over $2\frac{1}{2}$ % cent. The rice shipped at these ports is much cleaner now than formerly. Arracan, 9,900 bags weighed on board, 698 tons 9 cwt. 1'4 quarters; out-turn 650 tons 4 cwt. 1'20 quarters net. All rice freights from the East Indies, are by weight, net delivered.

929. **Arracan.** Lieut. NUTHALL says, "the chief produce and export is rice, Akyab being the shipping port. The loading season commences after the breaking up of the rains (which are very heavy) or the south-west monsoon, *i.e.* in all November. At this time grain

of the last year's crop can be procured, the natives being then able to unhusk the paddy, and prepare it for shipment—a process which cannot be accomplished during the rains, as it is necessary first to dry it well in the sun. Clean rice is never kept ready, beyond what may be required for local consumption, as it does not keep well in the damp climate of Arracan. Vessels have occasionally arrived before the above period, without having sent previous orders, and thereby incurred great loss and delay. The **harvest** usually commences during the latter end of November, with the Laroong and Longphroo rice, which is nearly all cut and exported by the end of December, or early part of January. The Latooree next ripens; and the harvest terminates in February, with reaping the Nacrensee, which forms the most bulky part of the crop, and is partly held for exportation during and after the south-west monsoon, and before the next crop becomes available. Ships coming for a cargo of rice of the last season's growth should not arrive before the end of November, and for new rice not before the end of December or beginning of January, when the harvest having been partially made, labour can be employed in collecting, husking, and cleansing the grain for shipment."

930. **Rangoon** rice or Nga-sein rice is grown in that portion of the Burmese territory ceded to Great Britain in 1826. The harvest is most active in December and January. It is exported from Rangoon, and the first shipment of the new crop to Europe takes place usually about the end of February. The bulk is shipped by the setting in of the rains, which, in 1863, began 19th May, and in 1864, on the 26th; shipments sometimes extend to June. A basket is 68 lbs. net. Nga-sein rice weighs about 54 lbs. \varnothing bushel. At Rangoon, "in season" rice means that which is shipped from January to April; "out of season" after April. The term "newly unhusked" means unhusked shortly before shipment, so that it has not been long exposed to the heat of the climate.

931. The ship *J. P. Wheeler*, Capt. ROBINSON, of Boston, 855 tons register American, 940 English, and which could carry 1,500 tons of coal, took in 1,400 tons of rice at **Moulmein**, in December, 1857. This rice (not so clean as that at Rangoon and Akyab, being say one-third paddy) was packed in gunny bags containing two maunds, 152 to 164 lbs. each, according to the cleanness of the contents. The dunnage each side the keelson, teak logs, slabs, plankings, &c., two feet, decreasing to 18 inches half way between the floor and the beams; then bamboos up to the main deck, say four inches, or the thickness of an ordinary bamboo; 'tween deck, masts, &c., the same; mats over all, and against iron bolts, round stanchions, &c. With

the 1,400 tons there was sufficient space left for 700 bags, but she was in fair trim ; her hold 23 feet deep, was stowed to a depth of 20 feet. All her provisions and water, excepting two casks, were below. It was calculated that the rice would decrease in weight 50 tons before discharging, or say $3\frac{1}{2}$ ¢ cent. On the passage fore and after hatches were kept open constantly ; the main hatchway in fine weather.

932. Moulmein harbour is infested with two kinds of worm ; the larger penetrates and totally destroys the wooden stocks of anchors long submerged (unless well paid with coal tar), by boring holes nearly as large as a pea ; the lesser are usually on the surface, and penetrate the ship's side between wind and water, through holes so small (being only the size of a needle) that they are not perceptible by an ordinary inspection. Ships for this trade should be coppered high enough to be clear of the surface when fully laden. The teredo, or timber worm, seems to be more destructive in Moulmein river than in most other tropical waters, and no safeguard but extra and secure copper-sheathing seems to have been devised. If once they have obtained a footing, it is a good plan to lighten the ship, when the heat of the sun and want of water will destroy them quickly.

933. Quantities of rice are exported from the East Indies, Siam, and Sagon to **China**. Ships taking rice into Macao are exempt from measurement duty, paying only \$50 to the procurador. At Amoy, they are admitted free of port dues ; with export cargo they are liable to half the present port dues, or 25*m.* 5*c.* per ton register ; ships laden with rice and having a considerable portion of general cargo intended for another port, are exempt from duty ; if partly laden with rice and general cargo, they are charged full tonnage dues, should any of it be sold and discharged.

934. **United States.** In Carolina, sowing is generally completed by 15th of March ; harvest commences 31st of August, and extends through the end of September, sometimes later. From South Carolina, it is usually shipped in barrels or tierces of six to seven cwt. each ; dunnage say nine inches in the bottom, 14 in the bilge, and $2\frac{1}{2}$ against the sides ; the tierces stowed bilge and cutline, and carefully chocked. In tierces, Carolina rice is always clean ; otherwise it is with all the husk or paddy on it. Small quantities of Brazilian rice are shipped at Maranham for England, the weight is equal to peeled Rangoon, say 60 to 65 lbs. ¢ bushel.

935. **Bilge-water** with a rice cargo is very offensive, especially if there is a difficulty in getting at the body of the water by the main or bilge pumps ; the stench from the dregs is then almost unbearable.

Tonnage. Bengal, Madras, Bombay, and Moulmein ton 20 cwt. in bags. At Moulmein, about 14 bags clean rice or 15 or 16 paddy, make a ton. New York 20 cwt., Baltimore 2,240 lbs. net, in casks; a tierce is computed there at a standard of 50 cubic feet. Bahia freight ton, bags, 23 cwt., barrels 18 cwt.

Measures—East Indian. An East Indian maund of rice by factory weight 2 qrs. 18 lbs. 10½ ozs., bazaar 2 qrs. 26 lbs. 2 ozs.; a pukka maund 80 lbs.; a bag 1½ cwt. [The bazaar maund, 82 lbs. 2 ozs., is always used for rice.] Bengal baugee of paddy 8 lbs., clean rice 9½ lbs. In Bombay, rice in the husk is sold by the moora of 25 paras. Rangoon tayndang, 56 lbs. nominally, but in reality 53½ lbs.; a “ten,” commonly called a basket, should weigh 58½ lbs., it is usually reckoned at a half cwt. Bangalore Buddah one-fourth of a maund. Malabar robbin 84 lbs. East Indian bamboo ordinarily 5 pints; a maund (75 lbs.) contains 21 bamboos. A basket of Arracan 26 lbs. and a fraction. Ceylon parah of paddy 30 to 33 lbs., husked rice 42 to 46. A Singapore bag is equal to two Bengal maunds; a maund 100 lbs. troy or 82.287 lbs.; a basket of peeled Moulmein is about 56 lbs., mixed 60, and paddy 51. Madagascar moucha about 7 pints or 6 lbs.; Malacca gantong 6½ lbs., quoyane 40 Chinese peculs or 5.400 lbs., Macao pecul chapa 200 lbs. Malay basket (56 lbs.) consists of 30 chupahs. At Manila, the coyan varies from 96 to 135 lbs. A Molucca bamboo 1 lb. 10 ozs. A Macassar gantong 8 lbs. 5 ozs. Philippine cavan paddy 96 lbs., cleaned rice 130 to 135 lbs. A Japanese koke 3,000 bags or bales. In the list of measures of grain, there are several applicable to rice.

Foreign Measures. A Turkish killo is supposed to weigh 100 okes; an oke is 2.8286 lbs.; 40 mecmedas or kellas make one Arabian temau or tomaud, which weighs 168 lbs. avoidupois. A last at Rotterdam is 4,000 lbs.; some say 2,000 kilogrammes or 4,424 lbs. An American cask 6 cwt.

Tares. The Customs' tare on Bengal single bags is 3 lbs., double 4 lbs. or 5 lbs. Another authority says East Indian in bags 2 ⅔ cent.; when in double bags the additional bagging is weighed separately and compensated (?). At Hamburg, the tare for Carolina is real, for East India 3 to 4 lbs. per bag. At Antwerp, Carolina is 12 ⅔ cent. in casks, and 13 in half-casks.

A Bushel of Calcutta rice as imported, weighs 64 lbs.; Madras as imported 64 lbs.; Carolina cleaned 54½ lbs.; all three free of husk.

936. **RIDERS.** Any tiers of casks stowed above the ground tier or above any other tier in a vessel's hold.

937. **RIO GRANDE DO SUL.** Vessels drawing more than 11 feet are not well adapted for the port. Anchor should be cast as near the custom-house as possible. Ships being numerous, are arranged in tiers along the coast—the Brazilians westward, British and other foreigners eastward. Charterers should hold in view the distinction between the two ports of Rio Grande do Sul and of Sao José do Norte. Brazilian tons are often calculated to exceed the British register tonnage by one-third. In the article hides there are several references to the trade of this port. The merchants of Rio Grande do Sul have framed a set of rules, which they style the “Customs of the Port;” they can only be considered to have been

made for the convenience of the merchants and to avoid disputes, and will not necessarily bind the master when they may be in contradiction to the charter-party; if, however, there should be nothing in it against the rules, the merchants will insist on them; they are as follows :—

RULES.

Vessels with cargoes consisting wholly of salt or coal, are allowed to continue to discharge all their cargoes in the anchorage of Sao José do Norte, which is much better than the southern anchorage; but vessels with general cargoes are required to discharge at the south (Rio Grande), being allowed to unload a sufficient portion of their cargo at the Sao José anchorage to lighten them, so that they may come through the shallow channel to the south, the cargo thus discharged being immediately brought over to Rio Grande in lighters. Bone-ash and ballast are usually completely laden at Sao José, and thereat, as at the deeper anchorage, most British vessels complete their cargoes of hides or other merchandise. In consequence of disputes constantly arising between foreign masters and their consignees, owing to the want of established rules whereby to regulate the settlement of accounts, it is resolved by the resident foreign merchants that the following regulations shall henceforward be adopted and adhered to, under the denomination of the "custom of the port."

REGULATIONS.

1. The consignees of vessels shall have the privilege of choosing at which custom-house entry shall be given.

2. The vessel shall bear the expense of all lighterage attendant upon entry at the south custom-house, unless there be a special clause in the charter-party or bills of lading to the contrary.

3. That upon entry being given to discharge at the south custom-house, and it be found necessary to lighten the vessel at the north, she shall, after being sufficiently lightened, be brought over to the south, if required.

4. The consignees alone shall be entitled to commission accruing from the consignment of the vessel.

5. That when a homeward charter is required, the consignees shall have a prior right of chartering at current rates, and in any case the charter shall be effected through their agency.

6. The commission for recovering outward freight shall be 5 % cent. on the amount payable abroad, or when the entire freight is so payable 2½ % cent., and whether the vessel be chartered at home or abroad for the return voyage, the consignees should be entitled to a commission, which shall in the former case be 2½, and in the latter 5 % cent. on the amount of freight.

7. The charterers shall have the privilege of sending their own stevedores on board; the vessel shall bear the expense of stowing the cargo.

8. The charge for custom-house agency shall be 32rs. 1,000p. and that a commission of 5 % cent. shall be paid by the vessel on the amount of the disbursements, unless such a charge be specially provided against by the charter-party.

9. That outward freight payable abroad, shall be recovered on delivery of the cargo, at the current rate of exchange for bills on London at the customary usage of 90 days, which rate shall be established by the latest transactions.

10. On adjustment of freight on salt, 28 alquieres shall be calculated to the ton.

11. That a committee of three of the undersigned shall decide in any cases that may be considered exceptional to these regulations.

12. The undersigned bind themselves to a strict adherence to all the foregoing rules. Rio Grande, 18th November, 1854. *[Signed by nine firms, of which four (1859) merged in other firms, one was dissolved, and one retired.]*

938. **ROPE, CHAIN, &c.** Cordage or rope, is hemp, hair, &c., spun into a thick yarn, several of which are twisted together by wheels. When made very small it is called a cord; thence to an inch, a line; and when very thick, a cable. All different kinds of this manufacture, from a fishing line or whiplcord up to a tow rope for a line-of-battle ship, went by the name of "cordage" formerly. Since Manilla hemp and other descriptions of rope came into use, the term cordage applies more to Russian hemp rope. Rope as cargo, matted for long voyages, is now usually packed in tarred wrappers. In England and in Russia important orders are packed in double wrappers. Rope should be stowed level, and kept clear of iron and metal, and of iron bound casks especially, as the heads are liable to destroy it by chafing. It should never be placed in that part of the hold where casks are likely to be shifted frequently. Palm oil, liquids, moist goods (sugar especially), and guano, will injure the appearance or deteriorate the value of rope. Bengal and Madras ton 50 cubic feet roping in coils, 14 cwt. lines and twines in bundles.

939. **Cables, Tow-ropes, Hawsers, and Warps.** By the Queen's regulations, 1862, the hempen cables on board ships of war are not to be stowed away until they are thoroughly dry; and when stowed, every precaution is to be taken to protect them from water. Such cables, sails not in use, and other perishable stores, are to be got on deck occasionally in fine weather, to be inspected and aired, the dates of the inspections, and the state in which the different stores were found, being duly recorded in the log book, as well as on the last page of the expense book of the officer in charge; the entries under each date to be signed by the captain and master. This is a most important duty with large ropes, as they are so difficult to dry thoroughly—a thick rope may appear dry on the surface and still be very damp inside; such a rope stowed away in a confined place below deck will heat and rot very fast. One month here will do more injury than twelve months' exposure on deck. To prevent this, some

owners give orders to their masters never to stow below deck a hawser once used. Cable-laid is a term that was much in vogue when hemp cables were used some years since, now it is more generally known as hawser-laid; parties ordering tow-lines seldom or never say they require a cable-laid rope, but that they want a hawser-laid rope. Hawsers, tow-ropes, &c., formerly made of Russian hemp are now preferred of Manilla—being much stronger and more elastic than hemp. Tarred Manilla is the most durable rope. During its high price, many large steam-ship companies began to use Russian hemp, but soon returned to Manilla again. Plain three-strand ropes (shroud-laid) are now mostly used by steam-ships, for hawsers and tow-ropes. A rope two inches in circumference and 120 fathoms long, weighs generally one cwt. To ascertain the weight of rope: the square of the circumference divided by four, equals the weight of a fathom in pounds; or multiply the square of the circumference by the length in fathoms, and divide by 480 for weight in hundredweights. A *machine* to weigh up to five cwt. would be found useful in most vessels, not only for the purpose of weighing rope, wire rigging, chain, &c., but all stores received on board, and occasionally to test the weights of portions of cargo. Steel towing hawsers are said to be much preferable to hemp or Manilla; as they are very much smaller they occupy less space and are more handy.

940. **Strength of Rope, Chain, &c.** A fathom of well-made rope-yarn is estimated to bear a strain of 84 lbs.; ordinarily a strain of 1 cwt. may be applied. By experiment, 4-inch rope breaks at a maximum of 5·3 tons, and at a minimum of 4 tons. 6-inch at a maximum of 11·75 tons, and minimum of 8·7 tons. 10-inch rope at a maximum of 31·7 tons, and a minimum of 24·2 tons. 34-inch ropes were tested in 1856: one made of Riga hemp broke at 3 tons 15 cwt., Neapolitan 5 tons. Good rope of 4½ or 5 inches will bear as heavy a strain as chain of half-inch; the rope will weigh about 5 lbs. and the chain 14 lbs. per fathom; 10½-inch cable will bear as heavy a strain as 1-inch chain, the hemp weighing 22 lbs. and the chain 56 lbs. to the fathom. These proportions though not always accurate are nearly so, and may serve for calculations of the intermediate sizes.

941. **Strength of Government Yarn** in round numbers, may be called 100 lbs., but the average strength of each yarn, in shroud-laid, is found to be greatest in the smaller sizes; thus, for 12-inch rope the mean average strength is 76 lbs. per yarn; 6-inch, 78·4; 14-inch, 92·8; 1-inch, 95·2; ½-inch, 104·5 lbs. One part of 8-inch is stronger than three parts of 4½-inch; for, as the number of yarns in, and therefore the strength (*S.s.*) of rope of different sizes, varies

with their areas, and as the areas of circles are proportional to the squares of their circumferences (*C.c.*) it follows that

$$\frac{S}{s} = \frac{C^2}{c^2};$$

and let n represent the number of parts of the small rope which are equal to the strength of the larger rope, then

$$\frac{ns}{s} = \frac{C^2}{c^2} \quad \text{or} \quad \frac{C^2}{c^2} = n.$$

Therefore, to find what number of parts of a small rope are equal to a larger rope—without allowing for the difference of the angle of twist, which, as shewn above, effects the strength of the rope—divide the square of the circumference of the larger rope by the square of the circumference of the smaller, and the quotient will be the number of parts of the smaller equal to the larger.

942. Shroud-laid rope is stronger than cable-laid in the proportion of 8·7 to 6. Cable-laid rope is so laid up to exclude the water. The strongest description of rope is untarred, white, three-stranded rope; and the next in the scale of strength is the common three-strand, hawser-laid rope, tarred. Three-stranded rope is one-fifth stronger than four-stranded. A splice weakens a rope about one-eighth. Shroud-laid rope is formed by twisting three or four strands together (these strands are made by twisting a number of threads or yarns together); this rope shews the same lay as the shrouds of a ship's rigging, from which it derives its name—shroud-laid. Hawser or cable-laid (which are both the same) is formed by twisting three or four parts of a shroud-laid rope together, the opposite way, that is, if the shroud-laid rope is laid right-handed then the hawser-laid rope will be laid left-handed. Some towlines are made shroud-laid, and are much stronger than if made hawser-laid, but are more liable to chafe, being so much more heavy than if hawser-laid.* Warp-laid is the same as hawser-laid; warp is a term given to the smaller sizes, say from six inches downwards, the larger ones being called hawsers. Tow ropes are generally from 7 to 14 inches, 75 to 90 fathoms long; hawsers 7 to 11 inches, 90 fathoms; warps from 3 to 6 inches, 90 fathoms long.

* This is questioned, because hawser-laid rope has a much rougher surface than shroud-laid, and if a shroud-laid gets chafed, it contains so many inside threads, it still retains very great strength, whereas, in hawser-laid, nearly all the yarns are outside.

943. **Manilla Rope.** At the Liverpool Chain Testing Works, May, 1861, Capt. GANDY, *Havelock*, tested several samples. Being in favour of Manilla, but having no standard to guide him as to its strength he obtained samples, four fathoms long, from the best makers in Liverpool and London. As it was not his object to publish the superiority of one maker over another the samples were privately marked, but if the makers' names had been published, it must have been equally satisfactory as there was scarcely any difference in the strength, not 5 per cent.—a result which could not have been expected in hemp rope, as Russian hemp differs so much in strength from the process of rotting and preparing in Russia; it establishes the fact that Manilla hemp, well spun and manufactured, can be depended on to one standard of strength, wherever manufactured.

No.	Inch.	Threads.	Weight per fathom.	Breaking strain.
1	4 $\frac{3}{4}$	147	4 $\frac{1}{2}$ lbs.	8 ton 10 cwt.
2	3 $\frac{1}{2}$	69	2 lbs.	3 - 15 -
3	4	147	2 $\frac{3}{4}$ lbs.	5 - 10 -
4	4	153	3 $\frac{1}{2}$ lbs.	6 - 10 -
5	4	117	3 lbs.	6 - 0 -

ADMIRALTY TEST FOR RUSSIAN HEMP.

Inch.	Per fathom.	Test. .
4 $\frac{3}{4}$	5 $\frac{1}{2}$ lbs.	5 ton 16 cwt.
3 $\frac{1}{2}$	2 $\frac{3}{4}$ lbs.	2 - 15 -
4	4 lbs.	4 - 6 -

By comparison it will be seen that the test for Russian hemp rope is a little over one ton per lb. per fathom, whilst Manilla rope is two tons. Although the result as to strength was similar, still in wearing it was believed that there would be a difference; one rope, for instance, containing 153 threads, and another, same size, only 117 threads, the former being machine and the latter hand spun. Manilla answers best for towlines, warps, &c., being stronger and more elastic than Russian, and when tarred is the most durable in use; it is 20 p cent. lighter and 50 p cent. stronger than Russian; but to be serviceable it should be spun fine and even, which is best done by those manufacturers who draw and spin by machinery, as the hemp is spun full length—for hand spinners it requires to be cut.

944. **Coir**, made from the fibrous covering of the cocoa nut, comes mostly from Ceylon, Cochin, Bombay, &c. When confined in the hold it will soon rot if wet, or if water is allowed to drop on it, especially fresh water, which decreases its strength and causes injury from which, as with oil, it never recovers. Constant immersion in salt water is said to strengthen it. Coir junk or yarn or fibre are often injured by stowage with oil at Ceylon, &c. When hanks have been stowed at Cochin, between casks of oil, spontaneous combustion has occurred; see oil. Coir rope weighs more than one-third, but not one-half as much as hemp rope.

Freight. At Madras, a ton of coir in screwed bales is 50 cubic feet; bundles or loose 10 cwt. Madras 10 cwt. coir rope in coils. Bombay ton coir rope 10 cwt. or 50 cubic feet; a candy 588 lbs.

TABLE OF FATHOMS, FEET, OR INCHES OF A ROPE OF ANY SIZE NOT EXCEEDING 14 INCHES, WHICH MAKE A HUNDREDWEIGHT.

In.	Fa. ft. in.	In.	Fa. ft. in.	In.	Fa. ft. in.	In.	Fa. ft. in.
1	486 0 0	4½	24 0 0	7½	8 3 6	11	4 0 3
1¼	313 3 0	4¾	21 3 0	8	7 3 6	11½	3 5 7
1½	216 3 0	5	19 3 0	8½	7 0 8	11¾	3 4 1
1¾	159 3 0	5¼	17 4 0	8¾	6 4 3	11½	3 3 3
2	124 3 0	5½	16 1 0	8¾	6 2 1	12	3 2 3
2¼	96 2 0	5¾	14 4 6	9	6 0 0	12¼	3 2 1
2½	77 3 0	6	13 3 0	9½	5 4 0	12½	3 2 0
2¾	65 4 0	6¼	12 2 0	9¾	5 2 0	12¾	2 7 8
3	54 0 0	6½	11 3 0	9¾	5 0 6	13	2 5 3
3¼	45 5 2	6¾	10 4 0	10	4 5 0	13½	2 4 9
3½	39 3 0	7	9 5 6	10½	4 4 1	13¾	2 4 0
3¾	34 3 9	7¼	9 1 6	10¾	4 2 2	13½	2 3 6
4	30 1 6	7½	8 4 0	10¾	4 1 8	14	2 2 1
4½	26 5 3						

Use: At the top of table marked inches, fathoms, feet, and inches, the first column is the thickness of a rope in inches and quarters; the other three the fathoms, feet, and inches that make up a hundredweight of such a rope.

Suppose it is required how much of a 7-inch rope will make a cwt. Find 7 in column 1, under inches or thickness of rope, and against it is 9 5 6, which shews that in a 7-inch rope, 9 fathoms 5 feet 6 inches, will be required to make a cwt.

945. **Wire Rigging.** Double serve the heads of all parts of the rigging, and fill the splices up with white lead or zinc white, and double parcel over. These precautions are intended to prevent the sea-water from getting to the rope. It is advisable to inspect the splices of the rigging every year or two, and to coat the splices with

paint, if necessary, to prevent rust, which is very liable here owing to the damage often done in splicing wire rope.

946. **Iron Cables.** By Queen's Regulations, 1862, captains of ships are instructed to attend, most carefully, to the state and preservation of the iron cables; and to guard against accident from their becoming weakened from wear or corrosion, he is to cause a survey to be held every half-year. The bolts and the pins of the joining shackles, and the chain messengers, are to be examined at the same time, care being taken that the swivels in the former are well cleaned, and warm tallow run into the sockets. All the shackles and bolts are to be rubbed over with soft tallow, and the pins with stiff white lead, in order to prevent corrosion, and to cause the cables to be unshackled more quickly when required. Whenever the shackle bolts are driven out, the greatest care is to be taken to remove from the sockets, with the chisel supplied for that purpose, every particle of the old lead pellets before providing new ones.

947. **ROSIN**, or resin, is the black matter which settles at the bottom when oil of turpentine is distilled. E.I.Co.'s ton 8 barrels. A barrel 2 cwt.

948. **RUMMAGE**, to, signifies to clear a ship's hold, in order to examine its contents, or to remove goods or luggage from one place to another. In Customs' language it means searching the ship to see that all goods liable to duty are landed, and that nothing is concealed for the purpose of evading the duty, or smuggling.

949. **SAFFLOWER.** Bengal, Madras, and Bombay ton 50 cubic feet in screwed bales; Bombay 50 cubic feet in cases, 10 cwt. in bags.

950. **SAFFRON** is the orange coloured stigma or centre part of a purple kind of crocus, which is kiln-dried and made into cakes; the plant grows chiefly in Spain, France, and Germany. E.I.Co. 14 cwt. to the ton.

951. **SAGO** is the inner pith of a species of palm tree growing in the Phillippines, Moluccas, and Cerain. In all seasons it is carried in its rough state in conic packages of 20 lbs. each, from Borneo and Sumatra to Singapore, where it is cleansed, manufactured, and packed in wooden boxes, ten of which contains fifteen peculs nearly; see tapioca. Bengal, Madras, and Bombay ton 50 cubic feet in cases; Singapore 14 cwt. well pressed. A bag 1 cwt.; a chest 1½ cwt. The tare at Hamburg for Brazilian 4 to 6 lbs. per bag.

952. **SAILS**; see canvas.

953. SAL AMMONIAC, the hydrochlorate of ammonia. Bengal and Madras ton 15 cwt. in bags, Bombay 18 cwt. ; Bengal, Madras, and Bombay 50 cubic feet in boxes or cases.

954. SALT cannot be kept too dry. In coasting vessels dunnage is seldom used. When ships with 'tween decks are laden with common salt in bulk, it is usual to leave open the main hatches of the lower deck and to remove some planks each side, to replenish the lower hold and relieve the beams of the weight as the cargo settles ; in this case the salt in the 'tween decks should be free from the sides and extremities. For cargoes requiring shifting boards, see ballast. Specific gravity, common, 2.130.

955. RUNCORN. Old salt shrinks very little. Merchants delivering to the Tyne and Dublin calculate at 2½ ¢ cent. for shrinkage of old salt, and 5 ¢ cent. for that newly manufactured. Being free from lime, Runcorn is preferred for use for curing Newfoundland fish and meat. Table or stoved is made up in lumps of 50, 55, 60, 80, and 120 to the ton ; the smaller sizes occupy of course more space in the hold than the larger. The component parts of ground rock salt used for agricultural and chemical purposes are—

Chloride of Sodium.....	97 ¢ cent.
Chloride of Potassium.....	
Chloride of Magnesium	} 3
Sulphate of Lime.....	
Insoluble Matter	
	100
And of common Salt	
Chloride of Sodium.....	92
Water	8
	100

Four clear days are considered sufficient at Gloucester to load a cargo of 140 tons of salt.

956. A cargo of 150 tons of common coarse salt, shipped dry at Liverpool, has made out 156 tons when discharged in damp weather at Newcastle. This might have been partly occasioned by the difference in the mode of weighing in and weighing out, for the cases of turning out over at Newcastle, are very rare, and when they occur it is not usually more than 10 cwt. ¢ cent. ; and then only if the salt is old and coarse. Cases have occurred of small cargoes of new common salt shipped in Liverpool turning out 10 tons short at Newcastle ; 100 tons of salt fresh from the pans at Norwich and Winsford, and conveyed in the river flats, have turned out 10 tons short at Liverpool. A salt merchant says, with salt not stoved, a vessel

will have plenty of space, and ample dunnage may be used, but with stoved salt a vessel will not stow her cargo without dunnage by 15 ¢ cent. Another merchant says, a vessel capable of holding 150 tons common salt will not stow more than 135 tons fine stove salt, nor even that unless it should be well made and firmly stowed. In bills of lading for salt not stoved, there is always inserted for the master's protection a clause, "natural waste excepted;" and this extends to 5 ¢ cent.; ordinarily it will not average more than 2½ ¢ cent.; that is the usual weight allowed to coasting vessels. The natural waste in foreign voyages is calculated at from 2½ to 7½ ¢ cent. according to circumstances.

957. Salt, from its moisture, should be divided by bulkheads from other goods; even crates should not come in contact, for the straw will rot and breakage ensue; it will draw liquids out of casks, and it is said, reduce the strength of spirits, tea, &c., and prevent port wine from fining. The evaporation from salt which settles against the under part of the decks will, when it falls, prove very injurious to some descriptions of perishable goods below—iron and machinery especially.

958. On loading salt for the **Labrador trade** a merchant says: broom and wash the hold, and dry it with mops or swabs. If the vessel is sharp built, sound and perfectly tight, the risk can be run of stowing the salt without either dunnage or mats, provided also that the ceiling is tight; this would be a saving, for mats are expensive, and the cargo will work out easier when there is nothing to impede the shovel. If there is any fear of leakage, dunnage and mats ought to be used, as there will be plenty of room. Keep the cargo up high under the main hatch that the vessel may not be too stiff, and so labour heavily in a sea-way. Should the salt be old and dry it may be better to sprinkle the top sparingly with salt-water; this will crust it, and in a great measure prevent the cargo from shifting in heavy weather. When landing the salt, if the vessel is likely to be tender, and it is necessary to retain 10 or 15 tons to keep her on her legs, trim it all out under the main hatch, where it will be handy for delivery. If the hold is dunnaged it can then be broomed down and washed. Should fresh-water be convenient use it, for the hold will dry quicker and keep dry better than if with salt-water. Some merchants object to sprinkling the cargo with salt-water, or to having the hold washed after discharge, either with fresh or salt-water; they contend it is preferable to brush the hold clean without it, because by wetting a crust is formed so hard that when the cargo is discharged, the salt comes out in lumps of 4 or 5 lbs.

or even more, and they are sadly in the way when measuring, and cause much trouble to those using the salt for fishery purposes, as all the lumps have to be broken up nearly as fine as the rest before they can be used. It sometimes occurs that vessels bound to Newfoundland and Labrador, unload at out-ports where weights and scales are not at hand, and it is more convenient to discharge by the hogshead, or still more so by a tub. One can easily be made from an American pork barrel. Put it on end, with the upper head out, measure into it $17\frac{1}{4}$ imperial gallons of water, chalk all round on the inside at the edge of the water, and then saw the top part off. Or if no measure is at hand, say with a rule, mark off 16 inches from the inside of the bottom up, and mark it all round at this, and saw off there, if the diameter at top inside is $20\frac{1}{2}$ inches, and it measures from the top diagonally to the bottom opposite on the inside $24\frac{1}{2}$ inches, it will contain 21 old wine gallons or the one-third of a hogshead; this, according to the quality of the salt, will weigh from 158 to 165 lbs. net each. Should the inside diameter of the barrel be less than $20\frac{1}{2}$ inches, allow the tub to be deeper than 16 inches. Say weigh 10 tubs from top of cargo, 10 from middle, and 10 from bottom, and take the average to reckon the number of tons a vessel will turn out. These tubs come useful for discharging, as they just contain the full of a wheelbarrow, and are handy for tipping over the side into boats, &c.

959. To obtain the quantity of a cargo in tons, that in moios being given at Figuera, the following mode was adopted :—

	212 moios Lisbon measure.
	60 alquieres to the moio.
	<hr/>
	12720
	22½ lbs. the alquiere.
	<hr/>
	25440
	25440
	6360
	<hr/>
Lbs. to the ton—2240	286200 (127½ ton, say
	2240
	<hr/>
	6220
	4480
	<hr/>
	17400
	15680
	<hr/>
	1720

This cargo weighed out at St. John's, Newfoundland, only 118 tons. When shipped in May, it was green, the vessel had a long passage,

and it was discharged in fine weather. As a rule, salt from Figuera will generally turn out from 5 to 7½ ¢ cent. short of the measurement there. Coarse well-made salt from Liverpool, will generally make out as shipped.

960. The barque *Elisa*, of Drontheim, Capt. JOHN MARTENS, 114½ commercial lasts Swedish, 257 tons English, took in at **Cadiz**, in February, 1864, 189½ Spanish lasts of salt (say 388 tons) which occupied perhaps a little more space than a cargo of coal. She is 115 feet long, 23½ broad, and has 17½ feet depth of hold. With the salt she drew aft 14½ feet, forward 11 feet 9 inches. With 386 tons Cardiff coal, carried more easily than the salt, she drew aft 14 feet 4 inches, forward 11 feet 5. In her best trim for sailing she is 3½ feet by the stern. The *Elisa* is sharp-bottomed; her salt was dunnaged with 100 bundles of brushwood; an ordinary vessel with a flatter bottom might require 200 bundles. Salt measure at Cadiz: 4 barrels=1 cahice, 6 cahices=1 last. The brushwood, 100 bundles cost \$4, and 60 mats at 6 reals=\$18, being at the rate of 20 reals to a Spanish dollar. 51½ Cadiz lasts of salt make about 100 tons English.

961. Large quantities of salt are imported annually into the **River Plate** for the purpose of pickling beef and hides. Of this a considerable proportion comes from Cadiz, where it is sold by the last, 5,000 lbs. *Sp.* nominal, but which is said to weigh occasionally little over 4,000 lbs. *Sp.* Capt FEENSTRA, of Amsterdam, from whom most of this information is obtained, states that the first time he loaded at Cadiz he was charged for 161½ lasts, the second time 160, and on the third 143½ lasts; on each occasion the ship was filled, so that there must be considerable discrepancy in the mode of weighing. With the smallest quantity, nominal, 143½ lasts, his vessel was deeper than with the larger quantities, nominal. She could not take 160 lasts=310 tons English. Dunnage is seldom used when the ship is perfectly dry, clean, and in good condition. The ordinary price of salt is four Spanish dollars ¢ last, but sometimes it is \$12. The charges in connection with the proceeds of a cargo of Cadiz salt delivered from a ship of 320 tons, have been

	ozs.	ozs.
2,400 fanegas, @ 15, free on board		281 4.0
Freight 32s. 6d. ¢ ton, each ton 7½ fanegas } 320 ton, £520 (67s. ¢ ounce)	155 3.5	
Seal.....	0 0.2	
Brokerage ½ ¢ cent.....	1 6.4	
Commission 7 ¢ cent.	19 11.0	
	<hr/>	176 5.3
Net.....		<hr/> 104 14.5

This account does not appear to include the cost of the salt, say 160 lasts at 4 dols.—40 ozs. An onza or oz. of gold is worth 16 dols.—a dollar 4s. 2d., and a real 2½d. ; say 4 dols. 7 reals=£1.

Ordinarily ships chartered with salt for the River Plate, have 30 running days to discharge ; larger ships more ; and even then they have to fall upon demurrage, being generally used as floating stores from which small parcels are taken day by day to suit the convenience of vessels loading hides. The salt is sold and delivered by the fanega (100 fanegas=19.426 quarters English), and it is customary to pay freight 7½ fanegas to the ton. The fanega is divided into four quartillos, and one of these, in the form of a tub, is used by the lighterman, who it is alleged sometimes retains a portion of the contents of each tub, to the loss of the purchaser. The quantity of salt put out by a ship, on which she is entitled to charge freight is governed by several contingencies. First, there is the irregularity of the lastages at Cadiz ; then there is the natural evaporation on the passage, calculated at 5 ¢ cent., but which of course depends much on its dryness or dampness when shipped, the condition of the ship, and the state of the atmosphere. Thirdly, we have to look to the correctness of the discharge. Generally the delivery is equal to 15 or 16 fanegas ¢ last received, and more if the measurement at Cadiz is good. The price of salt at La Plata varies considerably ; sometimes it is 20 reals ; in 1855 at Monte Video it was 5½ reals. The rate formerly was greater in the river than at Monte Video and Buenos Ayres, but the difference now is not much. More salt is required in December, January, February, and March, than during the other part of the year. [Experienced merchants at Buenos Ayres calculate the ordinary cost of salt delivered on board in Cadiz at 10s. ¢ ton of 20 cwt., and the price obtained in the River Plate to range from 10 to 16 reals ¢ fanega delivered over side, which is less than Capt. FEENSTRA calculates—15 reals. They calculate 15½ fanegas to the last, and 7½ fanegas to the ton, which will give 48½ lasts to 100 tons English. The manner in which the salt is measured to the lightermen requires close attention by the master or his officers, for if thrown into the tub heavily and in any way pressed down, the measurement will go much against the ship.]

962. In the port of **Rio Grande** salt is received by half alquiere measure or larger, at master's option ; each alquiere is assumed to contain 80 lbs. Brazilian weight (equal to 80.95 British) more or less, and as freights are usually paid by ton weight delivered, the master should ascertain the average weight of the measures of salt he delivers. He is allowed by the custom-house a margin of

10 $\frac{1}{2}$ cent. over or under the manifest ; but if the quantity delivered should pass this limit either way, he becomes subject to a fine, unless there is proof of damage by stress of weather.

963. Salting. A ship well salted is allowed one year longer on the first letter at LLOYDS. Some ships, especially North American, are, in order to preserve the timber, supplied between the skins with rock salt, or waste pickling salt from beef, pork, hides, &c., which is thrown into the air-holes in the hold and 'tween decks, and under the covering boards, until the entire space is filled. Forward and aft, pickle is injected by a powerful syringe. Ships thus supplied require particular attention with dry cargoes, as a certain degree of dampness always pervades the sides and bottom in wet weather. They should be provided with cell pieces sloping outwards, and the skin ought to be caulked tight enough to keep the salt from the hold when it dissolves.

Tonnage. The Admiralty allows 10 sacks of salt, 2,240 lbs., to a ton for freight. Bengal and Madras ton 20 cwt. $7\frac{1}{2}$ River Plate fanegas go to an English ton. At New York 36 bushels from Europe, or 31 from the West Indies. At Baltimore 40 bushels Liverpool brown salt in bulk, 34 ditto ground salt, 31 St. Ubes, Cape Verde, &c., in bulk, or 30 West India salt in bulk. When Mediterranean wheat is freighted at 1s. $\frac{3}{4}$ quarter, salt is rated at 4s. 9d. per ton of 20 cwt.

Foreign Lasts. At Riga 18 barrels make a last ; 4 tons rock salt, or $2\frac{1}{2}$ tons Liverpool white salt is about a last. At Memel a last is 6,000 lbs. At Bremerhaven the ship last is 12 barrels. At Hamburgh it is $2\frac{1}{4}$ to $2\frac{3}{4}$ English tons. At Cadiz the last is 5,000 lbs.

Measures. A peck of salt weighs 14 lbs. ; a bushel 56 lbs. ; a bushel of rock salt 65 lbs. Fine stove lump salt is made up in blocks, three of which ordinarily weigh 1 cwt., but they vary considerably ; sometimes four, five, and even six blocks weigh only 1 cwt. according to size.

Foreign Measures. A Prussian scheffel of salt is 54 lbs. ; Portuguese raza $1\frac{1}{2}$ bushels. At Lisbon the moyo is divided into 15 fanegas, 30 alquieres, 240 quartos, 480 selemis, &c. ; the moyo=23 bushels. At the Cape Verdes the alquiere contains 817 cubic inches ; 50 alquieres=19 bushels ; the moyo or moio $22\frac{1}{2}$ bushels, or say $2\frac{1}{2}$ tons. At Genoa salt is sold by the mondino of 8 mine ; 1 mana= $3\frac{1}{2}$ bushels nearly. Cephalonia barile usually 67·244 lbs. A centinago in the Ionian Isles 4,410 lbs. ; American barrel fine 280 lbs., coarse 320 lbs. ; a bushel fine 55 lbs., coarse 50 lbs. ; Brazilian alquier 80 lbs. ; Bombay parce or parah 1,607·61 cubic inches=6 gallons ; a rash is about 40 tons, nearly $14\frac{1}{2}$ lasts ; Ceylon parah 52 to 55 lbs.

964. SALTPETRE, NITRATE OF SODA, &c. The terms saltpetre and nitre are occasionally used by masters of vessels and others as if they were the same. In speaking of nitrate of soda from Peru, &c., it is frequently termed South American saltpetre, but it means

nitrate of soda, and is so understood in the London market. Sometimes nitrate of soda is called Chili saltpetre, but of late this is going out. In commercial language, and in chemical works of repute, saltpetre is nitrate of potash; nitrate of soda is sometimes called cubic nitre. Nitrate of potash is not imported from South America.

Saltpetre, nitre, or nitrate of potash, is a species of salt found on the surface of the earth. It seldom comes from anywhere except India, usually Calcutta, where the best and purest is shipped; Bombay saltpetre is less pure, has a much smaller crystal, and is of a darker colour. Fine saltpetre has a large hexagonal crystal—sometimes two or three inches long, and laminated; the larger pieces are generally tubular, but the size of the crystals varies very much in different lots even without a corresponding variation in quality. It is slightly deliquescent, as much almost as common salt, but is easily “sweated,” and becomes damp and liable to damage other cargo through the dampness of a ship’s hold, or if stowed with moist goods, such as sugar. It is soluble in three and a half times its own weight of water at a temperature of 60°, and in rather less than its own weight of boiling water. When exposed to a heat of between 600° and 700° Fahrenheit, saltpetre melts, and becomes an opaque mass, which, on cooling, has been called mineral crystal or *sal prunella*. At a red heat it is decomposed, giving off oxygen—the great promoter of combustion. When ignited, it produces a white flame and burns with little noise; but when impure, it sparkles and crackles. It is used in the composition of gunpowder, and should not be stowed with inflammable materials, such as oil, tallow, &c.; it is perfectly harmless of itself, but in case of fire, when combined with those articles, produce a compound having all the dangerous properties of gunpowder. The same contingency occurs with sulphur or brimstone; see jute, combustion, general cargo, and sugar. Care should be taken that drainage of saltpetre should not be absorbed by any of the materials mentioned. By steeping fibrous matter, &c., in a solution of this salt, a powerful kind of gunpowder is made. The stains caused by the leakage from saltpetre will continue in the skin of a ship many months after. Dunnage 9 to 12 inches each side of the keelson, and 12 to 15 inches in the bilges, carried well up. When saltpetre, sugar, and rice form the dead-weight, it is recommended to stow the saltpetre in the after hold, to keep the ship in trim and the cabins free from the exhalations of the sugar, which should go in the main hold; rice in the fore hold. Saltpetre ought to be covered with mats to receive bales or cases. At **Trieste**, when

saltpetre appears on the bills of lading as *merchandise*, the vessel is liable to confiscation and a heavy penalty. Saltpetre is considered one of the most risky articles to deal with in the long list of imported goods, owing to its liability to be washed away by sea-water, while other goods are more or less damaged by it. The underwriters, who will assure against almost any casualty, halt at saltpetre, and will usually assure only against total loss, thus avoiding average of any kind. Saltpetre is generally sold on a guarantee of a "refraction" not exceeding say 5  cent. ; the remainder, say 95  cent., is pure nitrate of soda. When refined, the refuse of the 5  cent. is termed *petersalt*. There is some difficulty in determining the weight of a cubic foot of saltpetre. By experiment good dry 5  cent. saltpetre weighs 25  cent. more than water, and the English refined saltpetre of commerce 30  cent. ; a cubic foot of 5  cent. rough as imported 75 to 80 lbs. when well shaken down. Nitrate of soda is rather heavier than saltpetre.

965. **Nitrate of Soda**, nitre, cubic nitre, sometimes Chili saltpetre, is chiefly imported from Iquique and other ports on the west coast of South America. This nitrate has many properties common with saltpetre ; fuses at much the same temperature ; at a red heat is decomposed, and forms also dangerous compounds when in contact with organic matter, &c., with some of which it explodes just like saltpetre. It is soluble in about twice its weight of water at 60°, is so much more deliquescent than the former that it becomes moist much quicker. When the difference between the two nitrates has been once observed, they can never after be mistaken for each other. Nitrate of potash (saltpetre) has larger, longer, cleaner, and better defined crystals than nitrate of soda, the crystals of the latter appearing, in general, more dirty and confused, ill-formed and granular, having a rather flatter form than saltpetre, and always much smaller ; in fact, more like coarse common salt. On the tongue nitrate of soda melts quickly ; nitrate of potash is more difficult of solution. Nitrate of soda is not used in making gunpowder, but chiefly for the manufacture of sulphuric and nitric acid, and for a top dressing in farming operations. By a chemical process which sets free its soda and throws the nitric acid into combination with potash, it can be converted into saltpetre. It is usually sold at £12 10s.  ton when saltpetre is £36 ; some calculate 20s. against 50 or 55s. Being deliquescent it requires good dunnage, and to be stowed in a dry position, apart from brimstone and under sugar, from which it should be well blocked off. A cubic foot well pressed down weighs about 88 lbs.

966. All, or nearly all, ships with cargoes of nitrate or ores are too stiff; experienced masters try to make them a little tender, so as to turn their sides up and fall away from a heavy sea. Deals, plank, or wood of any kind, for platform or dunnage purposes, are very expensive all along the west coast of South America. If freights for wool are low, it is desirable at Peruvian ports to take as much dead-weight, say nitrate of copper ore, as will complete the whole cargo, it generally pays best. It is considered advantageous to take in a dead-weight of nitrate, and to fill up with wool; if both are properly stowed, the ship will be easier at sea. Cargoes of nitrate and of copper ore occupy only so much of the hold as will leave ample space for ventilation. Large quantities of borate of lime are shipped at Iquique; if in the same vessel with nitrate, being lighter, it should go on it, and be well dunnaged with mats over all, to prevent injury from vapour. At **Pisagua** the mines are about 50 miles from the shore. Water is obtained there but not in Pisagua, excepting from a steam-condenser, and as there is no herbage for the mules and donkeys which bring the nitrate to the coast, they die in such numbers that strangers are said to be easily able to trace their route to the mines by the number of dead bodies lying about. Excepting three gold ounces to the consignee, there are no **port charges** at Pisagua. Nitrate is also shipped at Mexillones, Ochata, and several other little open bays in Peru, in bags varying from 150 to 180 lbs. each; at Iquique, they usually weigh 280 lbs. gross. When loading, masters should be cautious not to sign bills of lading for intake weight. It is customary to sign charter-parties for "gross weight" and "quality unknown," "not accountable for breakage of bags," "all on board to be delivered," &c. Many of the bags are rotten when they come on board, having been in store for several months; if not, they are generally rotten on arrival in Europe, and careful masters always sign bills of lading, "not answerable for condition of bags on delivery." As there is no vegetation at Pisagua, dunnage is usually obtained at Valparaiso and Callao; if horns can be had, so much the better. Dunnage as high as possible; casks are sometimes used; they are not so dangerous as with copper ore, which, when a cask is broken, falls in immediately; whereas if a cask continues whole for five or six days, the nitre by that time becomes solidified; for this reason, the bags are sometimes stowed open or hollow below. Nitre has usually to be dug out of the hold on discharging, and if there is not more than a loss of 5 $\frac{1}{2}$ cent., it is considered satisfactory, and the master obtains a gratuity.

967. The ship *Abbot's Reading*, of Liverpool, Capt. THOS. POWER,

which registers 420 tons, is 108 feet long, 23½ broad, and has 17½ feet depth of hold, left the port of **Islay**, Peru, in May, 1862, with 10,000 quintals of nitrate, averaging 22 to the ton English, say 454 tons shipped at **Pisagua**, and 1,190 bales Peruvian wool, 17 bales to the ton, 70 tons weight shipped at Islay, with some hides, say in all 530 tons. So laden she drew 16½ feet forward and 17½ feet aft, her ordinary draught with a full cargo of coal. There were usually kept on board, for any dead-weight cargo, about two standard (240) spruce deals, which on this occasion were ranged as a platform, with the addition of old broken spars and fenders as bearers. One end of the deals was placed on the keelson, and the other four feet high in the bilge, the object being to raise the weight off the bilges and away from the ship's sides to the centre, fore and aft. It was found advantageous to place the deals as high as possible, especially in the bilges, as it made the ship easier in heavy weather. With less dead-weight and more light freight, they would, of course, be kept lower. A ground tier of nitrate was then placed on this platform, commencing from about three feet before the foremast, and ending seven feet abaft the mizenmast. The bags were run up pyramidically towards the centre of the upper deck amidships, leaving the wings in the 'tween decks all clear fore and aft. This plan is considered well enough for small ships, or for any kind of ships when intending to fill up with light freight, but where they are say 5½ or 6 times the breadth of beam in length, trunks like those used for copper ore (or with *all nitrate* or other dead-weight cargoes) are recommended, in which case the nitrate should be run right fore and aft, keeping the greatest bulk in the centre of the ship. The stowage of the nitrate in the *Abbot's Reading* being completed, it was well dunnaged over with dry hides, backs upward, overlapping each other sufficiently to prevent any particle of the nitrate from touching the wool which was then stacked upon the nitrate; it filled the remainder of the hold and 'tween decks. The wool was well dunnaged at least five inches from the ship's sides everywhere, including the 'tween decks; the dunnage wood was placed perpendicularly against the side, so that in case of leakage from the topsides, the water would run down uninterruptedly under the bilge platform. Had it been placed fore and aft, the dunnage would have become a stopwater, and in the event of leakage the wool would have been ruined. The hatches were then well battened down. On nearing Cape Horn, about the middle of June, hard, dry, easterly gales were experienced, and a sort of smoke or vapour was observed on board. With foul or head winds the vapour issued from the

forecastle; when running free or before the wind, the whole current passed through the half-deck and cabin. About a week after rounding the Horn, some of the crew complained of weakness and of contraction in the knees and elbow joints, and were treated for rheumatism. Although the ship was lowering her latitude every hour as she approached the equator, and the weather was improving daily, yet the men, to the surprise of the master, became worse, and were unable to stand for any length of time. On the 13th July, in lat. $37^{\circ} 0' 5''$ S., lon. $40^{\circ} 13'$ W., the ship sprung a leak, which kept the weakened crew constantly at the pumps. About the latitude of Rio Janeiro the port pump burst; the weather however continued fine. Although liniments were applied, the disorder, scurvy, (not rheumatism as first supposed) became worse, and five seamen were confined to their beds in a helpless state on the 11th August, in lat. $8^{\circ} 19'$ N., and only two remained to work the ship. On the 13th the carpenter repaired the port pump. Strong S.S.E. and E.S.E. winds prevented any approach to the Azores. The legs of the sick men were now drawn completely up under them; and there was only one left on deck, but he could scarcely put one foot before the other without steadying himself by the ship's rail. Although a thousand miles from land, the master very prudently got the anchors over the bows and the chain cables on deck, fearing there might not be sufficient strength left to do it when nearing port. She arrived safely at Liverpool in September—140 days. The fifty days' sickness was attributed to the vapour from the nitrate. Had she not been provided with CUNNINGHAM's patent topsails, Capt. POWER could not have navigated the *Abbot's Reading* with only three men. Her stores were excellent, and the crew accommodation ample.

968. Nitrate shipped on the coast of Peru sometimes lies on the wharves from five to eight months, during which it dries and hardens, and becomes in every way better for transport. It appears that the nitrate shipped in the *Abbot's Reading* was in a very damp raw state, having just come down from the mines. The evaporation was no doubt increased by the heating properties of the wool which came chock up to the hatches, and they being tight, forced the vapour to find an exit through the fore-castle and cabin. It is recommended that masters having similar cargoes should, after rounding the Horn, avail themselves of every favourable opportunity to open the hatches, or by other means, to ventilate the cargo. The evaporation from Peruvian nitrate varies on a voyage to Liverpool from 4 to 16 p cent. With an ordinary full cargo, having an evaporation of 6 p cent. the *Abbot's Reading* (three former voyages) and

lightened her draught 6 inches on arrival at Liverpool. With the cargo laden in May, 1862, she lightened 8 inches during the passage, and there was a loss of 10 $\frac{1}{2}$ cent. on the intake weight. Experienced merchants consider that the nitrate on board the ship must have been very impure if the vapour came from it; they conclude that it arose from the wool.

969. The *Margaretha Roesners*, Capt. EGGERS, of Rostock, where she registers 195 lasts or 429 tons English, took in at **Pisagua**, in January, 1864, about 600 tons of nitrate of soda, and 30 tons of leather at Valparaiso. She had space left for about 200 tons of leather. The dunnage, wood and plank obtained at Valparaiso, was laid about 13 inches each side the keelson, and 12 inches in the bilges. The nitrate was in bags containing 200 or 300 lbs. each, and after being stowed across the ship below, was brought up pyramid-fashion to the hatchways. Subsequently it depressed four feet, when bags were taken from the sides and placed under the hatchways. The 'tween had been removed, and care was taken to prevent the beams from being broken by pressure from the cargo. She is 129 feet long 28 feet 6 inches outside breadth, has a depth of hold of 16 $\frac{1}{2}$ feet, and is 6 feet 2 inches high in the 'tween decks. With the nitrate cargo she drew 16 $\frac{1}{2}$ feet aft, and 15 $\frac{1}{2}$ forward; the same as with 600 tons New South Wales (Newcastle) coal. The ship lay 300 yards from the shore, whence the nitrate was taken by her boats. In the hold, a boy unhooked the tackle, and the whole of the cargo, which took only six days in loading, was stowed by a Peruvian, whose skin appeared to have such substance and firmness that it resisted the effects of the nitrate, which made the hands of the crew quite soft; he wore a thin dress, worked without boots, carried the bags on his back, and received for stowing \$5 $\frac{1}{2}$ 1,000 quintals, each quintal being 100 lbs. The nitrate was covered with boards to receive the leather. Through evaporation, the *Margaretha* drew two inches less on arrival in the English Channel, than when she started. The wastage occurred chiefly during the first week after shipment. Shippers calculate the loss at 3 to 4 $\frac{1}{2}$ cent., and never more than 5 $\frac{1}{2}$ cent. unless the ship leaks.

970. The *Ravenscraig* (see linseed) loaded at **Iquique**, in October, 1862, 600 tons nitrate of soda, in her lower hold, and 225 tons orchilla weed in the 'tween decks, when she drew 19 feet aft, and 19 feet 9 inches forward. On discharging in January, 1863, there was a loss by evaporation of 4 $\frac{1}{2}$ $\frac{1}{2}$ cent. on the nitrate. Not only were all the rats, mice, and vermin destroyed, but even all the wood lice in those parts of the ship touched by the cargo; she continued free

until the reception of a cargo of rice, when vermin came on board with the dunnage and matting.

971. Nitrate shipped at Iquique, is dug out of the earth in immense plains beyond a range of mountains, part of the Andes. As it arrives, the bags are stacked in the warehouses. Eight months are sometimes occupied in storing a cargo, and while that part first stored is dry, the last is green, and is therefore liable to leak. When stowed in a ship's hold, it is preferable to receive the green first, and to arrange it equally over her bottom. If put in one part only, say forward, and leakage occurs at sea, the trim of the vessel will be altered, and she will then, of course, become too deep aft. Nitrate is brought off at Iquique and at Pisagua in boats called **balsos**; they are about 10 or 12 feet long, are formed of skins, and shaped something like a canoe, but rise more at the ends—the bow especially. They are provided with a kind of deck throughout their entire length; the space under the deck is air tight. Two of these balsos are fastened together, side by side, about two feet apart, by wooden stretchers near the bows and sterns. A longitudinal piece of wood is attached at each end to the middle of the stretchers, and then runs equi-distant from, and parallel to the balsos. On this framework two folded hides are placed overlapping; they are not fastened, but by use adapt themselves to the shape of the framework, and become a platform for the reception of the nitrate of soda, and keep the surf from it; the materials altogether do not weigh more than 30 lbs. While on the beach, about four or five bags are placed on the platform. The bows being near the water's edge, and the balsos inflated, a native boatman seizes their after ends, and waiting the approach of a heavy roller, launches his frail craft on its crest, and at the same moment places his knees on the stretcher aft. In this posture he goes out on the roller, and at the proper time takes up a paddle (previously laid cross-ways on the bags) provided with a blade at each end, and being grasped in the middle with both hands, the boatman uses it very adroitly on either side, and thus propels and steers at the same time. He dare not stand upright or the craft would be liable to capsize, as it draws only three or four inches of water. At a distance of 30 or 40 yards from the beach, the nitrate is delivered into the ship's boats, which, when they have obtained say 50 bags, proceed a quarter or half a mile to the ship, into which they are hoisted by the usual purchase of the winch. The nitrate is at shippers risk immediately it is received in ship's boats.

972. The iron barque *Witch of the Tees*, 300 tons register, Capt. SETH COOPER, belonging to Messrs. BAKE & CO., of Philpot Lane,

London, loaded nitrate of soda at **Iquique**, sailed 3rd October, 1865, and arrived at Falmouth (112 days) 23rd January, 1866, and at Plymouth, her port of discharge, on the 28th. She is 145 feet long, (160 over all) 22 broad, and 12 feet 3 inches deep; from the upper part of her beams to the lower part of her combings, the height is 6 feet 3 inches. The barque is constructed with three water-tight compartments; the middle one is 90 feet long, and in this the whole of the cargo, 3,330 bags (gross weight 450 tons), was stowed. She then drew 11 feet 2 inches aft, and 9 feet 10 inches forward, which is her best trim. The dunnage wood at the bottom (she being an iron ship with no great depth of hold) was only 10 inches; in the bilges 9 inches, and in the sides, right up to the beams, 3 feet. Her hold is strengthened with iron stringers, which run from beam to beam, say about two feet from the sides. On these wood dunnage, about two inches thick, was placed to receive the first tier of the upper bags of nitrate. After this it was stowed without dunnage, from a foot to 18 inches off the sides. The keelson is 10 inches high; each side there were placed four bags flat—say about 8 feet. The next tier was a little wider, and so on, until the beams were reached. The first tier on the beams and stringers consisted of about 20 bags. The upper part of the cargo was rounded off, like the cover of a country wagon. The hatchway was filled in closely; the beams and stringers were well dunnaged, or they would have worked holes in the bags, and the rust from the iron would have rotted them. The dunnage in the sides in the lower hold was sufficiently open to allow a man to creep along (with a safety lamp) and see if any leakage had occurred. In a wooden ship there is not so much necessity to keep the cargo off the sides, for fear of injuring the nitrate, which is beneficial to wood and hardens it. The master stowed the nitrate himself, the skin from the tips of his fingers was worn off, and they bled occasionally. Some European stevedores protect their hands with leather, but they are not then so well able to control the bags. While loading from the balsos, the *Witch of the Tees* had an anchor out astern to keep her steady. The crew finished her in twelve days, but fine weather prevailed; with three labourers in addition she might have been loaded in perhaps ten days.

973. Although the barque was quite tight, the pump-well was sounded at sea at regular intervals. When first pumping out the bilge water, in order to ascertain if there was any leakage from the cargo, Capt. COOPER saturated some paper with it, and on applying a light the paper ignited immediately, by which the presence of nitrate was made palpable. Although when the cargo was completed the

hatches were put on with difficulty, yet it had settled down 30 inches on arrival at Plymouth. Bags of nitrate seldom move in the hold, and in this case they had not shifted an inch; they appeared to be locked one into the other, and had become so solid that it was necessary to use the crowbar to break them out. The stringers, beams, and iron knees of the *Witch of the Tees* were paid over prior to receiving the cargo with a mixture of red lead, bright varnish, and a little boiled oil. On discharging it was found that although the dunnage in the bottom was only ten inches thick, the iron-work was not corroded. Much of the dunnage wood under the bags was perfectly dry. With a deeper ship it would have been necessary to place more dunnage in the bottom to keep the cargo up for the sake of trimming her. Previous to the reception of the nitrate the barque swarmed with rats; on arrival in England only one was known to be on board. There was no apparent diminution of the cockroaches. The cat was much wasted, it was supposed by inhaling the vapour of the cargo when chasing vermin. It is said that cats when they take to lying on a pile of nitrate of soda become lethargic, and seem attached to the spot, getting gradually weaker, until they crawl away and die, apparently through inflammation.

974. Masters bound to Iquique should be careful not to get to the north of the Island, as there is a current constantly running north and the prevailing winds are from the south, so that a vessel may lose two or three days in getting back. A ship may stand close to the shore with safety, but if it fall calm her head should be put off immediately, as at times there is a very heavy swell from the westward; a constant surf runs on the beach. It generally falls calm about nine p.m. and the sea breeze sets in about eleven a.m. There are **no pilots**, and boats are not allowed to come alongside before the Port Captain has been on board, if they do they are fined \$50=3s. each. Launches can be hired at \$1 ~~per~~ ton; there are several at Iquique which will carry from 5 to 50 tons. If there are but three or four vessels in port, launch hire is reasonable. When their cargoes have been on board 48 hours, all ships must leave the port, and masters are not allowed to land after the vessel is cleared by the authorities. Fresh provisions are scarce, and the beef is not very good, being full of blood; all provisions have to be brought from other ports. Capt. COOPER considers that the health of a crew is much promoted by having a plentiful supply of fresh-water, so much that the men can wash their clothes in it on the passage home, and thus avoid the use of sea water, by which scurvy and some other disorders are, under certain circumstances, promoted.

PORT CHARGES OF THE "WITCH OF THE TEES" AT IQUIQUE.

	dol.	rl.
Anchorage	8	0
Tonnage dues, two reals $\frac{1}{2}$ ton	74	75
Stamped paper for manifest	2	0
For visit, seal, and certificate	0	75
Port Doctor	1	0
Franking sealed manifest	1	0
Consular fees	7	50
Port Captain's signature to muster roll	2	0
Customs' Officer for dispatching ship	4	0
Sailing license	3	0
Port Agency, Chili currency, \$50 @ 25 o/o prem.	62	50

\$166 50=£24 19s. 6d.

975. The *Witch of the Tees* left London in June, 1854, with passengers, who were landed at Brisbane, in Queensland; thence she proceeded to Newcastle, New South Wales, and took in coal for Wellington, New Zealand. She returned back in ballast to Newcastle, and shipped coal for Otago, and proceeded thence in ballast to Valparaiso, where authority was obtained to load at Iquique the cargo of nitrate previously referred to. In this round Capt. COOPER'S chief expenses were as follows: at Brisbane, **pilotage** in or out 4d. $\frac{1}{2}$ ton, 300 tons, £5 each way; light dues £3 15s.; health officer coming down the river in a steamer to Moreton Bay, 23 miles, £10, paid in this case by the passengers; towage up £15, ships must not draw over 15 feet; ballast, Moreton Bay, 9s., Brisbane 3s. $\frac{1}{2}$ ton. At Newcastle, pilotage in and out £11; tonnage dues £7 10s.; trimming 3d. $\frac{1}{2}$ ton; 420 tons, draught aft 11 feet 4 inches; forward 10 feet 2 inches (ships drawing more than 20 feet, haul off into the stream); entering and clearing £1 11s. 6d.; tug boats in and out £10 5s.; beef 3d. $\frac{1}{2}$ lb.; water plentiful. At Wellington, $\frac{1}{2}$ ton, pilotage in and out 3d., light dues 4d., ballast 5s., water 10s. At Dunedin, $\frac{1}{2}$ ton pilotage 6d., light dues 4d., ballast 5s., water 12s. and under; beef 8d., mutton 10d. $\frac{1}{2}$ lb.; entering and clearing £3 3s. At Valparaiso, custom-house £15; water 6s. $\frac{1}{2}$ ton; beef 3 $\frac{1}{2}$ d.; bread cheap; ships can now be moored safely; floating docks.

976. SALVAGE is the rescuing of property from the probable danger of being lost: and the award to the salvors is adjusted on the joint consideration of the value of the property rescued, and the labour done and danger incurred by the salvors. When an award has been given, it is well to ask the court to distribute it amongst the several claimants. The usual scale in the Admiralty Court is—ship receives $\frac{1}{3}$, the master $\frac{1}{6}$, and the crew $\frac{1}{3}$, in proportion to their wages.

2 L

977. SANDAL WOOD grows in the island of Timor, the South Sea Islands, in Western Australia, and in some parts of China. That produced in Australia is of good quality and is shipped in logs from four to six feet long, varying from three to eight inches in thickness. The product of islands is smaller in point of size, rarely exceeding three inches in thickness. It is obtained chiefly from the South Sea Islands, and seamen have a saying that it grows only where the natives are in a savage state. Ships send large whale boats, which are moored some distance from the beach; their crews are provided with loaded muskets, to protect them from unexpected attacks by the islanders, who stand in the water up to their arm-pits to carry on the traffic. In China the tree is usually found in rocky and hilly situations; when growing on low land the quality degenerates. As an article of commerce, the sizes are three or four feet long by four to six inches diameter; of these, eight to twelve weigh a pecul. It is frequently shipped in India for the China market, each piece being carefully branded at both ends. Many consignments have been re-shipped in England for China. Being valuable it is sold at per pound, weighed carefully. Sandal wood is very heavy and sinks in water; contact with oil, coal dust, &c., must be avoided; salt water turns it black. It should never be used for wing dunnage with other cargo, however convenient it may be in size; and care should be taken that the logs or pieces are neither cut nor broken. The stowage is simple, but care must be observed when filling in, especially with small pieces. Judgment is required in ballasting, especially if it is convenient or desirable to try for any deck loading; and if ore is not obtainable, sand or stone must be trimmed and kept low, and the largest and heaviest description of wood put in the ground tiers and worked amidships, with lighter stuff in the wings. No grease, oil, hides, or guano should be stowed on sandal wood, as it is easily stained and would be rejected as unsaleable and thrown on the ship. The markets of Singapore and China are supplied almost entirely from Swan River (West Australia), upwards of 3,000 tons having been shipped direct from the port of Fremantle (Swan River) during the first six months of 1869. The wood varies in size from logs two to three feet in circumference, weighing four or five cwt., to pieces of two or three pounds—which latter are better stowed in bed places or cabin lockers. The pieces, large and small, are stamped on both ends, but permission is frequently given, for the convenience of stowage, to cut a certain number. Freight is paid on the weights delivered. Bills of lading merely state number of pieces, weights stated to be so much, but unknown. In the event of

dispute "all on board to be delivered." An ordinary ship's crew, under the supervision of intelligent officers, and general instructions from the captain, could stow the ship without the expense of self-styled stevedores. The ballast would be stone, sand, and lead or copper ore, or some of each, the ore only being shipped for England *via* China, with a through bill of lading. The quantity of ballast would differ with the build of the vessel, but a ship carrying a quantity of wood equal to her register tonnage would carry well. Where a ship is very stiff the cables could be all ranged and secured on deck and the chain lockers filled with wood up and down, as also the cabins and all covered-in deck spaces. Many vessels have carried also partial deck loads, and there is no evidence that exposure to weather or sea-water tends to deteriorate the wood in the market. If the wood is not seasoned or has been recently cut, there will be probably a loss of quite two $\frac{1}{2}$ cent. in weight on delivery. At Liverpool, 16th June, 1853, *MULLER v. SIEVEN*, it was decided that the owner was liable for oil damage to sapan wood improperly used as dunnage. Bengal and Madras ton 20 cwt. for dunnage, which should be specified on the bill of lading; Bombay 16 cwt.

978. SAND, or mud ballast impregnated with sewage or other deleterious matter, may subsequently cause severe and sometimes fatal sickness among the crew; it should therefore be carefully selected. Occasionally, when shingle, &c., is shipped as ballast, the Customs' authorities on discharge, subject the vessel to light dues, &c., as if she were delivering a cargo of building stone; this liability induces masters to use sand or mud however unsuitable. In levying light dues, the authorities state that where a profit can be made on ballast, dues are leviable. Some masters are under an erroneous impression that when freighted with government stores their vessels are exempt from light dues, &c. Sand ballast for long voyages requires shifting boards, or shoring down; if not secured it is liable to shift.

WEIGHT OF SAND PER CUBIC FOOT.

Sand, river.....	118 lbs.	Sand, pit, clean coarse.....	100 lbs.
— Thames	103 lbs.	— pit, fine grained & clean	95 lbs.

EARTHS, &c.

The average quantity of cubic feet equal to a ton in weight.

Sand, river, as filled into carts...	21	Marl	28
Ditto, pit	22	Clay, stiff.....	28
Thames ballast	22	Chalk, in lumps	29
Gravel, coarse.....	23	Night soil	32
Shingle, clean.....	24	Earth, mould	33

WEIGHT OF LIMES AND CEMENT.

Description.	Weight bushel.	Weight cub. ft.	Description.	Weight bushel.	Weight cub. ft.
<i>In the Stone.</i>	<i>lbs.</i>	<i>lbs.</i>	<i>Ground.</i>	<i>lbs.</i>	<i>lbs.</i>
Plymouth Stone Lime	70	54½	Keynsham Blue Lias	63	49
Keynsham Blue Lias	80	62½	Lyme Regis ditto	70	54½
Lyme Regis ditto	75	58½	Roman Cement	77	60
			Portland Cement	100	78

1,000 building Bricks closely stacked, occupy about 56 cubic feet.

1,000 old Bricks cleaned and loosely stacked, occupy about 72 cubic feet.

979. SAN FRANCISCO. Capt. HOWARD CLARK, of the ship *Magnolia*, who was here in 1867, states that the stevedore's charges were 50c. ¢ ton for goods of every kind—iron, coal, measurement or deadweight; the American short ton is 2,000 lbs. Ships have to employ two clerks at \$7 ¢ diem each, when delivering general cargo. Importers or exporters sending goods to or from the wharf, pay 34c. ¢ ton; the wharfage for the ship is very high. Goods should never be allowed to leave the wharf without a clean receipt; by this it will soon be learnt whether they are in demand or not. When stowing wheat in bags, great care is taken with the dunnage; pieces of 3 to 6-inch scantling are nailed to the ship's sides, which are completely clap-boarded throughout; the bottom and bilges are covered with mats purchased from the stevedores at 7c. each.

980. Referring to Capt. CLARK's instructions given above, a mercantile firm at San Francisco, under date 4th March, 1868, says, the stevedore's charges are 75c. ¢ ton on railroad iron, and 50c. ¢ ton on all other goods, measurement or deadweight, the American ton being 2,000 lbs. **Clerk's charges**: ships have to employ one or two clerks, at the captain's discretion, the expense of same being \$5 ¢ day when landing coal, \$8 ¢ day for general cargo. "Goods should never be allowed to leave the wharf without a clean receipt;" this is correct, and would save captains much trouble and annoyance if carefully attended to. The remarks regarding the stowage of wheat are suitable; great care is always taken with the dunnage, and captains are well satisfied with the stowage.

981. Captains of English vessels always express themselves as well pleased with the despatch given in discharging and loading in San Francisco, and seem to think that it goes a long way in counterbalancing the extra expenses of this port. The great facility of

communication by the Overland Telegraph and Atlantic Cable, between here and Great Britain, make it easy for captains to refer the acceptance of freights to their owners, and obtain a reply within twenty-four hours.

982. The ship *Devonport*, Capt. T. S. KENNEDY, belonging to Messrs. TEIGHT and SMITH, 158, Fenchurch Street, loaded grain at San Francisco, in 1868, sailed 22nd December, and arrived in London, 20th April. She registers 1,188 tons and admeasures 208 feet \times 37.5 \times 21.8; 'tween decks 7 feet 3 inches high. The cargo, 1,436 tons, was all in bags averaging 150 lbs. each net, 151½ gross. The dunnage was 10 inches in the bottom, 16 in the bilges, clap-boarded over all; scantling, 3-inch. The lower hold was full; in the 'tween decks there was a space left for say 200 tons. Shifting boards amidships, four feet below the beams. Six days loading; draught 29 feet aft and 20 forward. The cargo inwards was coal from New South Wales; **port charges** altogether £1,130. **Pilotage** in £38; out (steam) £38. The best **season of shipment** of grain at San Francisco is in September and October; a bushel averages 64 lbs.

983. With reference to Messrs. MENZIES' instructions, (which follow) the same firm says. **Mates and clerks**: these instructions as to the condition of cargo when received at the vessel, cannot be too carefully attended to, as claims are often brought against consignees of soda ash and soda crystals, on account of damage, and in a number of these cases, the packages have been quite clean on the outside, thereby raising a dispute between the consignee of the goods and the ship as to who was to bear the loss. The instructions as to the receiving and stowage of glass should be very carefully attended to, as there is more trouble here about that one article than about all other imports. Cases of glass should be very carefully examined by the captain's clerk, or some one especially employed, to see if they are sound before they are allowed to leave the ship's side. It would be much safer for the captain to require the shipper of glass to sign a bill of lading, in which the ship was not made liable for breakage or damage of any kind, as it is a rare thing for a vessel to escape a claim where they bring any quantity. The instructions respecting sheet and plate iron should also be carefully attended to, as claims are frequently sent in when but little damage has been sustained.

984. Messrs. MENZIES, LOWRY, and CHILDS, stevedores, San Francisco, California, having had many years' experience in discharging and loading vessels at this port, and having seen in very numerous instances cargoes discharged in damaged condition, which

might have been delivered in sound and good order, had sufficient precaution being taken in the stowage, are induced to circulate instructions with regard to loading ships, which their ample experience justifies them in believing will, if observed, prevent the great trouble, expensive litigation, and heavy claims which ships, and especially those arriving from England, have sustained, and which have operated to excite prejudices in the minds of owners and shippers, against this port.

INSTRUCTIONS for STOWING CARGO at SAN FRANCISCO.

MATES OR CLERKS on receiving goods should be careful to ascertain the contents of all packages, because, when they are received for shipment, through looking dry and in good order at the time they are put on board, yet Soda Crystals and such like articles will, on a long passage, absorb the moisture which arises in all ships, and dissolving, will destroy or damage any cargo with which they may come into contact.

COAL should always be stowed in the bottom, levelled off, and covered with boards or slabs, to prevent goods stowed on the top being soiled or rotted by contact. No goods should be stowed until all the coal is taken on board; the dust settling on them destroys their appearance and market value, especially if sweat or salt water gets on them during the passage; there is a certainty of claims being made.

SODA CRYSTALS, WASHING SODA, BLEACHING POWDER, CAUSTIC SODA, BLUE VITRIOL, AND ALL CHEMICALS should be stowed by themselves in the peak or run, and never on top or contiguous to other goods. Caustic Soda and Chloride of Lime, especially, should be kept at a distance from bales, which are sometimes eaten through, and rotted by being stowed within a few feet of the above articles.

IRON, whether in bar or in bundles, should be well dunnaged in the bottom, even if there is coal in the ship. Heavy suits have often been sustained against vessels for damage to iron, where there has been no dunnage or only insufficient.

SHEET AND PLATE IRON should be stowed in piles, and not spread, to avoid the damage which often arises from water running from one plate to another and damaging the whole. When spread out, and cargo placed on the top, the plates and sheets are buckled up and twisted, destroying their market value and affording opportunities for litigation. When stowing iron keep the various marks separate by means of rope or wood. The usual paint marks become obliterated on a long passage, when it is impossible to distinguish one brand from another; the iron has then to be separated by sizes, which causes great expense to the ship.

GAS AND WATER PIPE when bound by rope should be further secured by wire, even at ship's expense. The rope on arrival is invariably rotten, and the expense of assorting and rebinding is very heavy.

SALT. Care should be taken to stow this article away from iron, or any cargo likely to sustain damage by rust or damp.

BALES. These should not be stowed on the top of bar iron, when they will come in contact with the beams or stanchions. The spring of the iron causes the bales to chafe wherever they touch.

CRATES. Avoid stowing crates in the wings as dunnage to bales ; chafing is sure to occur. Block them off solidly with dunnage wood.

BOTTLED BEER IN BARRELS. In all cases care should be taken to prevent too many heights being stowed one on the other. If more than four, or at the most five, are so piled, the lower casks are invariably crushed.

GLASS. As there is much litigation about glass, too much caution cannot be observed in receiving it.

Although the packages when received may appear in perfect order, by careless handling on the steamers or railways, their contents may be shattered to pieces. But as the ship's hands are the last to handle them, claims are sure to be made against the vessel. Some one should be appointed to shake each case, and if necessary, to open it. Cases containing broken glass will rattle, and should be rejected.

CASES OF GLASS should always be stowed athwartships, and on edge. No dunnage should be used except in the wings to block off with. Dunnage is frequently used to level off a place where a case would not fill up ; the consequence is that it works down among the glass and causes much breakage.

SMALL CASES should not be stowed alongside of large ones, as they are almost sure to crack the glass in the large cases.

QUICKSILVER BOTTLES, PAINT AND NAIL KEGS, BRICKS, CRATES, or any kind of cargo should not be used as dunnage to block off with ; they are either crushed by pressure or work into bales or other packages, thereby causing great damage.

PORT CHARGES.

	\$	c.
Customs' entrance fee.....	2	50
Ditto clearance	2	50
Ditto bill of health	0	20
Surveyor's fee	3	0
Commissioner of Emigration	1	0
And if bringing Emigrants	5	0
U. S. stamps on Manifest, outward and inward, not exceeding 300 tons	1	0
300 and not exceeding 600 \$3 Over 600	5	0

SCHEDULE I.

RATES OF COMMISSIONS AND BROKERAGE, UNLESS OTHERWISE AGREED.

On purchase of stocks, bonds, and all kinds of securities $2\frac{1}{2}$ ¢ cent. ; sale of stocks, bonds, and securities, including remittance in bills and guarantee $2\frac{1}{2}$ ¢ cent. ; purchase or sale of specie, gold dust, &c., 1 ¢ cent. ; bills of exchange, with endorsement, $3\frac{1}{2}$ ¢ cent. ; ditto without endorsement, 1 ¢ cent. ; endorsing bills of exchange when desired, $2\frac{1}{2}$ ¢ cent. ; on sale of merchandize from foreign ports, with guarantee, 10 ¢ cent. ; on goods received on consignment and after withdrawn on invoice cost, $2\frac{1}{2}$ ¢ cent. ; receipt of bill of lading to be considered equivalent to receipt of goods. Purchase and shipment of merchandize (funds in hand) on cost and charges, 5 ¢ cent. ; ditto, without funds, costs and charges, $7\frac{1}{2}$ ¢ cent. ; for collecting and remitting delayed or litigated accounts, 10 ¢ cent. ; collecting freight by vessels from domestic Atlantic ports, on amount of freight

list or charter-party, $2\frac{1}{2}$ ¢ cent. ; collecting freight by vessels from foreign ports, on amount collected, 5 ¢ cent. ; for collecting general claims, 5 ¢ cent. ; for collecting general average on the first \$20,000 or any smaller amount, $7\frac{1}{2}$ ¢ cent. ; on any excess over \$20,000, $2\frac{1}{2}$ ¢ cent. ; for collecting and paying or remitting money from which no other commission is derived, $2\frac{1}{2}$ ¢ cent. ; on purchase or sale of vessels, $2\frac{1}{2}$ ¢ cent. ; entering, clearing, and transacting ship's business on vessels with passengers, cargo, or from foreign ports ; under 200 tons register, \$50 ; 200 to 300 tons, \$100 ; 300 to 500 tons, \$150 ; 500 tons and over, \$200 ; on vessels from domestic Atlantic ports, where no other commission is earned, according to tonnage, \$50 to \$200 ; for disbursements of vessels by consignees, with funds in hand, $2\frac{1}{2}$ ¢ cent. ; for ditto without funds in hand, 5 ¢ cent. ; procuring freight or passengers, 5 ¢ cent. ; chartering vessels, on amount of freight, actual or estimated, due when the charter-parties are signed, 5 ¢ cent. ; no charter to be considered binding till a memorandum, or one of the copies of the charter, has been signed. Giving bond when attached in litigated cases, on amount of liability, $2\frac{1}{2}$ ¢ cent. ; landing and re-shipping goods from vessels in distress, on invoice value, or in its absence, on market value, $2\frac{1}{2}$ ¢ cent. ; for receiving and forwarding goods, on invoice amount, $2\frac{1}{2}$ ¢ cent. ; effecting insurance, on amount insured, $\frac{1}{2}$ ¢ cent.

The foregoing commissions to be exclusive of brokerage and every charge actually incurred. Brokerage—\$1,000 and under, 2 ¢ cent. ; 1,000 to 3,000 $1\frac{1}{2}$ ¢ cent. ; 3,000 and over, 1 ¢ cent.

SCHEDULE II.

STORAGE ON MERCHANTIZE.

Measurement goods, ¢ month, \$1 ¢ ton of 40 cubic feet ; heavy ditto, \$1 ¢ ton of 2,000 lbs. or in either case the amount actually paid. Consignees may charge by weight or measurement. A fraction of a month to be charged as a month.

REGULATIONS.

CONCERNING DELIVERY OF MERCHANTIZE, PAYMENT OF FREIGHT, &c.

When no express stipulation exists per bill of lading, goods are to be considered as deliverable on shore.

Freight on all goods to be paid, or secured to the satisfaction of the captain or consignee prior to delivery.

After delivery to the purchaser of merchantize sold, no claims for damage, deficiency or other cause, shall be admissible, unless made within three days ; no claims shall be admissible after goods sold and delivered have left the city.

When foreign bills of lading do not expressly stipulate the payment of freight in a specific coin, foreign currency shall be reckoned according to the United States value thereof, and payment may be made in any United States legal tender.

Where foreign bills of lading expressly stipulate that freight shall be paid in a specific coin, then the same must be procured, if required, or its equivalent given—the rate to be determined by the current value at the time in San Francisco.

For tare on China sugar, four pounds is to be allowed for each mat containing four pockets of about 25 lbs. each.

All other rates of tare are to be allowed as by custom in New York, except when otherwise provided.

APPOINTMENT OF SURVEYORS AND APPRAISERS.

In all cases of average whether general or particular, on hull or cargo, the selection and appointment of surveyors and appraisers shall be agreed upon beforehand, by and between the insured or claimants in average, or their representatives on the one side, and the representatives of the insurers on the other; and the services of the persons so appointed shall be understood to be wholly disinterested as between all parties. No representative of underwriters shall be expected to certify, approve, or accept any surveys or appraisements made in contravention of this rule, but such documents shall be deemed to be wholly *ex parte* in character, and, as such, open to criticism, or liable to be rejected.

No ship-carpenter, rigger, or other mechanic, who may have served on a survey, shall be employed to make the repairs or any portion thereof.

COMMISSIONS IN PARTIAL LOSS.

All commissions actually paid in foreign and domestic ports, shall be chargeable as heretofore, to the various interests adjusted upon. But no other commissions shall be chargeable against insurers on disbursements in partial or salvage losses; nor in general average, when ship and cargo belong to the same owners; nor in any other case when no such commissions have been actually paid, and when no charge therefore would be customary or collectable in the ordinary course of the business of the insured, had no disaster occurred.

RATES OF WHARFAGE FOR VESSELS.

tons.	tons.	\$	c.	tons.	tons.	\$	c.
50 and under	75	4	00	500 and under	600	22	00
75	100	5	00	600	700	24	60
100	150	7	50	700	800	26	00
150	200	10	00	800	1000	28	00
250	300	12	50	1000	1250	34	00
300	400	17	50	1250	1500	41	00
400	500	20	00	1500	1750	49	00

U. S. TONNAGE DUES \$4 $\frac{1}{2}$ registered ton, paid in greenbacks. HARBOUR DUES $\frac{1}{2}$ registered ton, paid in gold coin. PILOTAGE, \$6 $\frac{1}{2}$ foot on all vessels under 500 tons; on those of 500 tons and upwards, \$7 $\frac{1}{2}$ foot, and 4c. $\frac{1}{2}$ registered ton.

985. SARSAPARILLA, the long fibrous root of a rough bindweed plant which flourishes in low moist ground. It is much cultivated in Jamaica. Madras ton 50 cubic feet; see smilax.

986. SEAWORTHY. Sec. 4, Merchant Seaman's Act, 1876. "Every person who sends or attempts to send (or is a party thereto) an unseaworthy ship to sea from any port in the United Kingdom, and every master who knowingly takes such ship to sea to the endangerment of human life, is to be found guilty of a misdemeanour unless he shows that the taking to sea under the circumstances was reasonable and justifiable."

Under Sec. 5. "There is an implied contract between the ship-owner and the master and crew, that the ship owner will use all reasonable means to secure the seaworthiness of the vessel at commencement of voyage."

Sec. 6. "Any ship in any port of the United Kingdom may, if unseaworthy, be detained by the Board of Trade."

987. A vessel to be seaworthy must be tight, staunch, and strong, her cargo properly stowed or properly ballasted (as the case may be), with a sufficient crew, the officers holding the requisite stores and provisions.

988. The ship *Bard of Avon* was chartered to proceed to Pensacola, and there load a cargo of pitch-pine timber for Greenock. The cargo having been duly laden, the vessel sailed from Pensacola on her homeward voyage, and encountering some very bad weather, she sprung a leak and was finally abandoned. The underwriters refused to pay the owner of the cargo on the ground that the vessel was not seaworthy when she sailed from Pensacola. On being refused the insurance, the owner of the cargo sued the shipowner for the value of his goods. Defendant pleaded that plaintiff was aware that the *Bard of Avon* was an old ship, and that the vessel had been approved by surveyors at Pensacola. The court found that the ship was unseaworthy, and gave judgment for the value of the cargo had the vessel arrived at Greenock, less amount of freight, making a balance payable by shipowner of £2,081 5s. 1d.

989. Common Pleas, February, 1875. This was an action brought to recover £421, advanced to the master of the ship *Thorwaldsen*, as well as £1,548, being the value of a cargo of timber which had been shipped in this vessel, and lost through the negligence of the master and the unseaworthiness of the ship. It appeared from the evidence that the *Thorwaldsen* was 800 tons, that notwithstanding she had received some injury on a previous voyage, she was chartered to carry timber, and there was a clause in charter-party that merchant was to furnish deck-load if required by the master. At the loading port (Sapelo), one of the owners of the ship being present (he being master of another ship), directed that the vessel should carry deck cargo in addition to a full cargo below deck. She carried on deck two large logs, about 50 feet long by 15 inches square. The deck was covered entirely. On the vessel leaving Sapelo she bumped on the bar and commenced making water. Soon after the vessel got to sea her deck beams gave way, and on 30th December she had to be abandoned. A Board of Trade inquiry found that the owner who had ordered the deck-load was to blame for the loss of the vessel. The jury returned a verdict for plaintiff for £420 advanced, and £1,548 value of cargo, on the ground that the vessel was unseaworthy when she started on her voyage.

990. Court of Queen's Bench, Guildhall, June, 1875. *SMITH v. KIRBY*. Steamer *George Cairns*, 448 tons, built 1872, lost on her first voyage from being

unseaworthy. This case had been tried twice, jury not agreeing first time. In September, 1872, this vessel loaded at Montreal 1,500 tons of maize, valued at £9,000; she also had 200 tons coal; total 1,700 tons. Soon after sailing she capsized and sunk. Underwriters refused to pay any insurance on ship or cargo, hence this action on behalf of the owner of the cargo. Defendant called the builders, who proved that the ship was constructed to carry 1,500 tons of cargo, but could not give the freeboard with that weight. The jury gave judgment for plaintiff.

991. SEALING WAX. Bengal and Madras ton 50 cubic feet in cases.

992. SEEDLAC. See the articles gumlac and lack. Bengal and Madras ton 50 cubic feet in cases, 16 cwt. in bags.

993. SEEDS. Flower and vegetable seeds should be packed in air-tight zinc cases when required to pass the tropics, or their germinating powers will be destroyed. When receiving seeds of any kind, of grain, or of coffee in bags, some masters spread mats or a sail under the hatchway down which they are going, to catch the grains that run out of the bags, and prevent them from choking the pumps. Seeds require special packing, and to be kept free from moisture; if possible no other cargo should be placed on them, they are very liable to become heated, and should be blocked off from cotton, &c., by cases or some other non-conductor of heat, or spontaneous combustion may ensue; see jute. Seeds generally occupy more space than calculated on and sometimes lose considerable weight on board ship; they are affected much the same as grain; see heat and fermentation in that article. In bags, with liberty to stow, like bags of rice, in the ends, the beam fillings, holes, corners, &c., they are usually taken at less freight. Calcutta seeds should be avoided as freight, unless packed in pockets for broken stowage. Oil seeds from Calcutta, Bombay, and Madras are becoming a most important article of export; they are usually stowed (being light freight) in the 'tween decks, in compartments, blocked right up to the under side of the upper deck, and are shipped all the year round, but principally during the north-east monsoon. At Calcutta 20 cwt. of linseed is reckoned to occupy 56 cubic feet, but if the bags are large the space will be less; if the linseed be in pockets the space will be greater. With an entire cargo of Calcutta seed it is calculated that unless they are very stiff, ships require ballast to the extent of one-third of their register tonnage. Bombay ton, some descriptions 17 cwt. In the Black Sea and Sea of Azof, whole cargoes are frequently shipped in bulk, when strong shifting boards are absolutely necessary. When Baltic wheat is freighted at 10s. $\frac{1}{4}$ quarter, linseed

is rated at 9s. Another authority says, when Mediterranean wheat is 1s. $\frac{1}{2}$ quarter, linseed and rapeseed are rated at 10s. 8d. $\frac{1}{2}$ quarter. When Black Sea tallow is 30s. $\frac{1}{2}$ ton, linseed is rated at 4s. 2s. 103d. It is stated that the custom of reckoning 29 hectolitres of rapeseed as equivalent to 10 quarters imperial is incorrect. In December, 1867, a cargo of rapeseed was laden at Antwerp and discharged in London, when it was found that 29 hectolitres produced 10 quarters and 2 bushels, involving a loss of freight to the vessel in question on 60 $\frac{1}{2}$ quarters. The imperial quarter is equal to 29077 hectolitres, but for freight purposes it is frequently taken at 2 $\frac{1}{2}$ hectolitres. It has been recommended that instead of reckoning 29 hectolitres equal to 10 quarters, masters when chartering should fix an equivalent in the charter-party, or stipulate for French measure. Canary seed not being in the Mediterranean Scale of Freights, it has been held that when a full cargo was shipped in Morocco, freight should be paid as for a full cargo of beans.

994. **Linseed, &c.** The ship *Henry Reed*, 888 tons, Capt. J. H. BLACKMORE, belonging to Messrs. GEORGE DUNCAN & Co., of London, left Calcutta, 21st August, 1864, with

13,650 Bags linseed, 14 bags to the ton.

714 Bags rapeseed, 14 bags to the ton.

1,050 Bags poppyseed, about 17 bags to the ton.

She is 165 feet long from stem to stern-post, 34 $\frac{1}{2}$ broad, 21 $\frac{1}{2}$ deep, and has 'tween decks 6 $\frac{1}{2}$ feet high. No rice, sugar, saltpetre, or other dead-weight cargo, being available, she took 100 tons of stone ballast, which was scarcely sufficient; this was levelled fore and aft. Dunnage of wood, bottom 12 inches, bilges 18, sides 4; double mats on the bottom, single against the sides. Linseed in double bags below; rape and poppy seed in single bags over. She was completely filled and drew 20 feet aft, 21 forward; on arrival in London, 14th December, 20 aft, 20 feet 9 inches forward; with the outward cargo of 1,050 tons, she drew 20 aft and 20 feet 4 inches forward; her best trim at sea is 20 feet aft and 20 $\frac{1}{2}$ feet forward. The **port charges** at Calcutta, all through, average about £1 $\frac{1}{2}$ ton register; steam tugs are necessary during the south-west monsoon, and when freshets prevail; although the moorings cannot be said to be safe, their cost is high. **Pilotage** in 600 rupees, out 750. The *Henry Reed* was built in the United States; she is flush, with a fore and aft deck house; coal and water forward in the 'tween decks, which are large; lower hold all clear; ship shifts from the docks to the river with 30 tons of ballast. It is probable that with the above cargo the

Henry Reed had some iron kentledge in addition to the 100 tons of stone ballast.

995. Capt. BAWDEN (see mirabolines) says that on the Madras coast seeds are packed in a superior kind of bag, especially niger seed, as they pierce themselves through, and being of an oily nature are very slippery, and run like quicksilver; if once they run there is no stopping them. When stowing it is necessary to mat well between the different goods, for should the bags burst there will be less waste. When taking seeds out of the lighter wet, either send them back or have a man (merchant's) from the shore with spare clean bags, and have them dried in the sun and re-bagged, which is preferable for both ship and merchant to sending them on shore again. It is almost impossible when much surf is on the beach to get through thoroughly dry although the boats are all dunnaged with brushwood. A good plan when the lighters come alongside is to note the time, also when they are discharged, as there are frequently great disputes who shall pay demurrage, which the boats claim if not discharged in their proper turn, or any considerable interval between two boats. There are sometimes twenty boats alongside, but they are soon cleared if the weather is fine. A ship can take in on a push, after a couple of ground tiers are laid in the main hatchway (which keep the dunnage firm) from 12 to 1,500 bags per day till they come to filling in. A little judgment and care is necessary when loading seeds, for if a little trouble is taken it makes very considerable difference in the amount of cargo the ship will contain or stow.

996. With regard to the freightage of seed on the Madras coast, Capt. BAWDEN says—"I would suggest to masters chartering in Ceylon to beware of being taken in (when loading on the Madras coast) as regards the ton of 20 cwt., especially with gingelly and other seeds, and particularly for Marseilles. I saw three masters thus deceived, as their vessels received one-fourth less freight, it having been stated that gingelly was only 5 p cent. inferior in stowage to rice. Besides which a tender vessel is liable, with seeds, to load top-heavy, unless the master keeps a good stiffening of ballast, such as stone, &c. The merchants at Bimlipatam told me that the best guide for masters was 'STEVENS ON STOWAGE,' and they referred with much satisfaction to your tables of schedule rates of the weights of various seeds, and the weights per bushel, compared with measurement tons, and of the cubical contents of a ton of 20 cwt., and other advice regarding seed cargoes. I was pleased (being a Plymouth man) to hear your work so highly spoken of. At Bimlipatam I could have sold half-a-dozen copies. The merchants there

had not such a book, and were very anxious to get mine, but I could not oblige all, so parted with it to my own merchant, and very thankful he was to get it. Will you kindly send your latest edition to the care of my owners, Messrs. BLYTH, GREEN & Co., 15, Philpot Lane, and I will remit the cost (21s.) by post-office order. When I remarked that it was a shame to take a master in with such misrepresentations, they said he should have looked at 'STEVENS ON STOWAGE' before signing his charter-party."

997. The ship *Ravenscraig*, Capt. INGLIS, belonging to Mr. LOCKHART, of Kircaldy, registers 588 tons, is 140 feet long, 32 broad, and has a depth of hold of 21 feet, with 'tween decks $7\frac{1}{2}$ feet. She loaded linseed at **Bombay** in January, 1864, and is said to be one of the first ships on board which screws were used there when stowing this article. She lay nearly a mile from the custom-house wharf, and the cargo was brought off in lighters carrying from 130 to 300 bags each. The bags were of common plain sacking, much better than gunny, say three feet long by two feet four inches wide, similar to ordinary corn sacks, gross weight 150 lbs.; those for "broken stowage" weigh 60 lbs. and are termed "pockets," for which half-freight only is paid. As the *Ravenscraig* was tender, the dunnage consisted of 60 tons of black rock stone (with 20 tons of wood), otherwise stone would not have been used. The dunnage was laid 18 inches deep on the floor and 9 in the bilges, and was covered with mats. As each tier of bags was placed fore and aft, a cask full of stone was rolled over it; men armed with wooden mauls followed and knocked down all protuberances, so as to make each tier as level and as square as possible. When the tiers reached such a height that a man could just carry a bag "cleverly" under the beams, stapling commenced. The tiers, say two at a time, were then placed each side till a space of about six feet was left clear amidships; planking was set against the tiers, until space barely sufficient to admit full-sized bags was obtained, by which the necessity for using the pockets (at half freight) was entirely obviated. On the 'tween decks, the dunnage, $1\frac{1}{2}$ inches, was laid across so as to lead the leakage, if any, to the scuppers; spare wood, two inches, against the sides; mats over all; single for bags, double for bulk. Here the tiers were screwed in both crossways and fore and aft. The matting throughout received special attention, freight being paid on the quantity of linseed delivered. Although the use of screws involves considerable expenditure of time it is considered economical because it makes the ship more seaworthy, a greater freight is obtained, and the use of pockets is avoided; otherwise perhaps 50 tons of these at half freight would

have been required. The *Ravenscraig* took in 11,017 bags which weighed 812 tons; for freight 12 bags go to a ton, which is 18 cwt. So laden she drew 19 feet 4 inches aft and 19 forward; with 850 tons Liverpool steam coal 20 feet 4 inches aft, 19½ forward. On arrival in England her draught, through the consumption of coal, provisions, water, &c., had diminished two inches. The **port charges** in with sugar at Bombay and out with linseed, including everything, were £340. The **season for shipment** of linseed there is from November to February.

998. **Cotton Seed.** The brig *Adela*, Capt. THOMAS PACKMAN, belonging to Messrs. BRANDRAN BROTHERS, of London, loaded cotton seed at Alexandria, in 1866, and sailed thence 6th November. She registers 212 tons, was built in Scotland, is very sharp, and has houses on deck—15 tons, 227 tons in all. No **port charges** were paid in Alexandria, where the water is good, and fruit plentiful, but must be eaten with caution or sickness may be engendered. The seed was in warehouses, a mile and sometimes two miles from the place of shipment—the Mamadie. Here it was received by lighters, of about 300 tons each, which conveyed it to the brig. A seaman belonging to her was posted at the store to see the seed weighed at the steelyard by the Egyptians, and took the number of bags, which were carried by donkeys and mules to the lighters, where a second seaman received the tally kept by the first, and saw the contents of the bags started into the lighters. The master however signed bills of lading “quantity and quality unknown.” Some of the cargo was brought down the Nile by canal lighters, out of which it was weighed and then sent to the ship’s lighters. The seed was passed out in baskets supplied by the brig. The Arabs who assisted in loading received £10; as the cargo went into the hold it was trodden down by six, eight, or ten of them, and when it approached the deck, scoops were used until the hold was completely filled. The cargo was so compact that a cask of water placed in the fore hatchway on its bilge, did not sink two inches on the passage to Plymouth. The brig had on board 15 to 20 tons of light Malta stone ballast, and 20 tons of very heavy Scotch oak and sabicu wood, all of which was used for dunnage, say nine inches bottom and bilges. A stiff ship would not require any ballast with this description of cotton seed. The brig was six days loading, and took in 2,614 ardebs, estimated at 306 to 309 tons; she then drew 12 feet 5 inches on an even keel, the same as with 350 tons Girgenti sulphur. With 380 tons Alloa coal, rather an over cargo, 13 feet aft, 12½ forward; a fair cargo for her is 16½ keel Tyne coal, with six months provisions—

say 10 tons. A ship may take about the same quantity of new Alexandria cotton seed, as of ordinary oats, not Archangel, which are heavy. With the 4,300 cantars of sulphur, shipped at Girgenti, there were 28 casks of pumice stone and 2 casks of wine, when there was space left for say 50 tons of light cargo.

999. **Lentils.** The Norwegian brig *Iris*, Capt. NIELS BOYE, which registers 222 tons, is 104 feet long, 26 broad, and $12\frac{1}{2}$ deep, took in 320 tons of lentils, in bulk, at Alexandria, sailed 28th February, 1868, and arrived at Plymouth 27th April. The lentils were so heavy (being estimated at 64 lbs. $\frac{1}{2}$ bushel) that there was space left for 250 quarters more, and the vessel laboured heavily at sea; the dunnage boards was 20 inches deep in the bottom. The cargo was brought off in iron lighters, and three days were occupied in loading. With the lentils the brig drew 12 feet aft and $11\frac{1}{2}$ forward, exactly the same as when laden with 320 tons of Cardiff coal.

1000. **Rapeseed—Spontaneous Combustion.** On Friday, 11th January, 1867, when the ship *Zoroaster*, Capt. WHITE, from Calcutta for London, was in lat. $17^{\circ} 20'$ N., lon. 37° W., a thick black smoke issued suddenly from the main hatch ventilator, and shortly after from other openings. Sail was shortened to topsails and the ship hove to. Got fire engines ready and broke open main hatchways, when a dense volume of smoke issued with an intense heat, as if from a furnace; managed to get out a few bales of jute which were on fire; from eight to eleven o'clock continued to pour down water apparently with little effect; at ten wore ship to the southward to list her to starboard, for the water to run where the fire was supposed to be; at 11.30 a.m. the smoke having decreased, got on deck a quantity of bales of hides in parts; by one p.m. there was a large space cleared in the 'tween decks, when the deck was found to be burning to the extent of seven or eight beams, and the rapeseed in the lower hold was seen to be in one mass of flame; at 1.30 commenced throwing a quantity of it and of jute fibre overboard; at four p.m. knocked off playing water below and throwing seed overboard, as the fire appeared to be extinguished; five p.m. put ship on her course, and opened all hatches for ventilation, and so continued on Saturday. On Sunday, at five a.m. steam or smoke was issuing from all the ventilators, and found that during the previous twelve hours the heat of the seed in the lower hold had greatly increased; water thrown on it not proving effectual shortened sail, and by the evening threw overboard 70 tons of the smouldering seed, which below was one charred and burning mass; by daylight on Monday the work was re-commenced, and was finished by ten a.m. When

the men reached the linseed (below) the fire suddenly stopped, only a few bags, and those in immediate contact with the rapeseed, having ignited. She arrived in the channel the first week in February.

1001. **Rapeseed.** Queen's Bench, 29th June, 1864, before the Lord Chief Justice, *DUMAS v. MARSHALL*. The action was brought to recover the value of a deficiency on a cargo of rapeseed on board the *Hooghly*. Plaintiffs complained that 675 bags had been shipped on board for them, according to the terms of a bill of lading, in good order and condition, except damage done by act of GOD or dangers and perils of the seas, and that about 20 bags had not been delivered. She was a vessel of about 2,500 tons burthen, and in 1863 was laden at Calcutta with a cargo almost entirely of seed, chiefly rapeseed and linseed, shipped in bags, each containing two "maunds," and weighing about 164 lbs. About 24,000 bags of rapeseed and linseed was consigned to different firms, the two chief consignees being RALLI's and SCHELLIZZI's, to each of whom nearly 7,000 bags of rapeseed were to be delivered, while to plaintiffs there was the comparatively small shipment of 675 bags of rapeseed. The bags, as usual, bore the marks of the different consignees, and the manifest would show how many were for each. The vessel encountered rather a rough passage; some of her seams opened; the result was that a considerable portion of the cargo was damaged by sea-water, which is peculiarly injurious to rapeseed, and many of the bags getting rotten, the seed escaped and was carried away by the pumps. On arrival it was found how many bags were due to each consignee. There were, however, many which by the wet had lost their marks, and much seed had escaped from the rotten bags, so that there were many and a quantity of loose seed, the ownership of which was undiscoverable. What was stated to be the usual course was pursued at the docks, and in the first place an account of the amount deficient on each shipment, as regarded bags which could be identified, was taken, and then the salvage—that is the bags or seed not identified—was divided among the owners in proportion to the amount of deficiency upon each shipment. In this case the number of bags identified was 315 short of the full number; on the other hand, there were 25 bags of rapeseed of which the marks were obliterated, and also a quantity of sweepings and refuse. The ultimate deficiency was 86 bags. Only 51 of the marked rapeseed bags were missing. Plaintiffs' shipment of rapeseed being 675 bags, there were only 631 of their marked bags which could be found, and thus they were 44 short. But RALLI's were also 30 short, and SCHELLIZZI's and all the other consignees were short; but only two consignees—plaintiffs and another firm—were deficient in rapeseed. Under these circumstances, 22 bags of the rapeseed not identified were delivered to plaintiffs, which reduced their deficiency to 22 bags, for which the present action was brought, they disputing the allotment of the salvage. It was not disputed that the right principle was to apportion the salvage among the consignees in proportion to their losses, but it was contested whether it had been carried out, and whether plaintiffs had a fair proportion accordingly.

It was admitted that in this case the reasonable and equitable course was to apportion the salvage among the losers, and it was not contended that the loss should be divided; indeed, the Chief Justice observed that so far as the bags or casks could be identified, the shipowner was bound to deliver them to the consignees whose marks they bore, and each consignee must bear his own loss. The question was as to salvage, and as to this, there being, it will be seen, two prin-

cial species of cargo—rapeseed and linseed—each divided into different shipments or consignments, the “sweepings,” or refuse was composed of both kinds of seeds, and, therefore, though the contents of the bags of which the marks were lost could be distinguished, the owners could not, and the refuse or sweepings could not be distinguished at all. Hence it was necessary to divide the refuse among the losers both of linseed and rapeseed, and also to divide the number of bags, whether of linseed or rapeseed, among those who had lost either one or the other. Thus, there was a necessity for very complicated calculations, involving a difficulty which was increased by the resemblance of the marks. There was not less than three different consignments with marks of the same letters, “H.R.S.,” and the only distinction was in a number, which was often obliterated, though the letters remained; and there was not less than 4,000 bags of rapeseed damaged. The principle pursued and upheld by the master and the dock authorities was, it will be seen, as far as possible, to make each consignee bear his own loss, which, of course, required that the bags found should as far as possible, be delivered to their proper owners, and that the loss of those damaged or destroyed should be borne by their different owners. So far as the marks could be traced of course they were regarded, and, in respect to bags rotted to pieces or destroyed, or of which the marks were gone, the master stated he was guided a good deal by the position of the bags, for, as far as possible, each man’s cargo as it arrived on board was loaded at the same part of the vessel; and though, as he stated, both he and the dock authorities were anxious to act as fairly as possible, and it was just as likely that one man as another got more than his due, there was, it will be seen, necessarily great scope for dispute. After a long retirement, the jury could not agree, and the parties agreed to withdraw a juror, and so end the case.

1002. **Flax-seed.** A vessel is chartered to Rotterdam, December, 1864, for flax-seed in hogsheads, the charterers supply the ballast and stow the cargo. The master signs bills of lading “free of spillage.” The vessel sails and makes a good deal of water; seed is pumped up. When discharging, one hogshead is found with an end out and about one-fifth seed therein, the other four-fifths were lost. After being discharged, the master finds two or three small holes in the bow about the water-line, without bolts, the vessel having only come off the slip just before loading. The consignees hear of this, and state that the ship should pay the loss. If the holes had not been there, the seed would have been found on the ceiling and would not have been pumped up. The owners ask the *Gazette*, who has to pay—the shipper, the ship, or the consignee? Also, whether the clause “free of spillage” exempts the ship if the casks are found broken down or without ends? Answer: the ship is responsible for the damage done by the water coming in. If the master or mate saw to the proper stowage, notwithstanding the charterer had the stowing, the ship needs no clause to protect her from loss through broken casks, &c.

LIST OF SEEDS, WITH INSTRUCTIONS FOR STOWAGE, &c.

ANISEED is the fruit of *Pimpinella anisum* used in the East as a condiment, and in Europe for essential oil. **STAR ANISE**, the capsule and seeds of *Illicium Anisatum*, requires to be stowed securely from the attack of rats. Bengal and Madras ton 8 cwt. ; Bombay 50 cubic feet. A case of Chinese star aniseed containing half a pecul, measures 4 cubic feet ; 12½ (or 6 peculs) go to the ton of 50 cubic feet.

CANARY. The seeds of the *Phalaris Canariensis* ; a native grass of Britain, and imported from Holland, Germany, and the Mediterranean. A bushel 53 to 61 lbs., usually 58½ lbs.

CARRAWAY ; a bushel 56 lbs.

CHICORY ; a bushel 56 lbs.

CLOVER requires 9 inches dunnage in the bottom, 14 in the bilge, and 2½ in the sides. Dutch and Continental is usually in bags ; American in casks or bags. It is susceptible of damage by water, but does not heat ; the grains are small, hard, glassy, heart-shaped, of purple and yellow colour, and very liable to run from the packages. A bushel 60 to 66 lbs. White Dutch is said to be heavier than red clover. A sack 2½ to 3½ cwt. ; a cask 7 to 9 cwt.

COLE OR COLZA ; this is the French designation for rapeseed, which see.

CORIANDER. A bushel 22 lbs.

COTTON ; see the report of the Committee on Freights. When loading at Alexandria, it is calculated that a vessel will carry 15 % cent. less than her dead-weight ; a vessel of 500 tons dead-weight, brought home 455 tons cotton seed.

CUMMIN. An aromatic produced by the *Cuminum Cyminum*. Black cummin, the pungent seeds of the *Nigella Sativa* are used instead of pepper. The chief supply is from Mogadore, Spain, and Alexandria, and some other ports in the Mediterranean. Bombay ton 50 cubic feet in cases.

DARI, another name for millet ; a bushel 53 to 56 lbs. ; see sorgho, and the Committee's Report on Freights at the close of the article grain.

DODDER.

FENUGARICK OR FENUGREEK. The *Trigonella Fœnum Græcum*, an emollient ; poultices are made of the flour for veterinary purposes, and the Arabs use it in fomentations. Madras ton 16 cwt.

FLAX ; see Linseed, and the article Flax.

GINGELIE, a white seed the size of linseed but with no gloss ; some are black or red, and the colours in the same parcel are often mixed ; see **SESAME**. A large quantity is shipped at Coconada and Bimlipatam. The trade in the East in this and other seeds is largely shared by the French for the purpose of making oils. Madras ton 17 cwt. A bushel 48 lbs.

GRASS, a bushel of mixed light fit for sowing, 16 lbs. ; some grass seeds weigh only 5 lbs., others from 30 to 40 lbs. % bushel.

HEMP SEED, the seed of the hemp plant ; a useful oil is obtained from it ; see the article hemp. A bushel 40 to 44 lbs.

LENTILS, a pulse, the *Ervum lens*, much used in southern countries; it forms the base of the popular substance sold as *Revelenta Arabica*. A bushel 60 to 62 lbs.

LINSEED, the seed of the flax plant; see page 556; dunnage 9 inches in the bottom, 14 in the bilge, and $2\frac{1}{2}$ in the sides. It contains a very great proportion of oil, and being more liable to shift than grain, requires more caution. When in bulk, fore and aft boards are recommended. Great care should be taken to secure ventilation, say with air trunks made of plank, having an aperture nine inches square. Large quantities in bulk pay less freight than in bags. American linseed sent to Ireland for seed purposes, is generally in hogsheds. English importers have to make good all deficiencies of weight below the rate of 53 lbs. $\frac{1}{2}$ bushel, and receive no compensation when the weight is over that rate. The *Rocket*, which loaded linseed at Taganrog in 1862, took in 1,832 quarters and delivered 1,945 quarters. From New York, in 1861, she turned out 2,035 quarters and allowing 100 quarters for lining, say 2,135 quarters. Sowing flax seed is frequently sent from Dutch or German ports in casks. Some Riga flax seed is classed "extra picked" and some "fine." Disputes have arisen on discharge, through mixture from leakage of barrels of the two sorts in the hold. Bengal ton 20 cwt. in bags, Madras and Bombay 18 cwt.; a Bombay ton is calculated at about 65 cubic feet. Best sowing Königsberg linseed is packed in barrels, whereof 24 contains $56\frac{1}{2}$ scheffels. A hogshed of Baltic linseed is 7 bushels.

MANGOLD WURTZEL, a variety of the beet root. A bushel 20 to 24 lbs.

MILLET, a common name for several species of small seed corn. In the Mediterranean the millets are generally called *dhurra*. On the Western coast of Africa the chief millets grown are *holcus lanatus*, *mollis*, and *spicatus*. *Holcus lanatus* and *holcus mollis*, are well-known British grasses. In the West Indies millet passes under the name of Guinea corn; see sorgho. Settlements for freight are made on the same terms as for linseed, or 10 $\frac{1}{2}$ cent. under the rate for wheat—the Baltic list running for wheat, other grain, and "seed" in proportion. A bushel 56 to 64 lbs.

MUSTARD is grown in England chiefly in Yorkshire, Cambridgeshire, and Essex; also in Holland. The harvest is usually in August and September, which is the season for shipment; it is generally packed in bags each containing three bushels; the tare is about 2 lbs.; a bushel weighs from 45 to 55 lbs. East India mustard seed is used entirely for making oil and oil-cake. Bengal ton 20 cwt., Madras 18, Bombay 17 cwt.

NIGER, a black shining seed shipped chiefly from Madras or Bombay, used for making oil; the grains are long and almost the size of hay seed. A bushel 45 to 47 lbs.

ONION. A bushel 36 to 38 lbs.

PINE.

POPPY. This is a very small white seed, and requires strong and tight packages to contain it. A fine oil is made from poppy seed, also oilcake. It has no narcotic property, such as opium or the juice that the poppy plant possesses. Bengal ton 20 cwt., Madras 15 cwt. At Calcutta a ton is calculated to measure upwards of 72 cubic feet. A bushel 48 lbs.

RAPE, the seeds of plants of the cole kind, or of a kind of cabbage which grows on a rich soil ; it is so fine that it is thrashed on a large cloth in the field ; they are liable to become heated. The finest rapeseed is produced in Holland, Belgium, and Germany. Much of it is crushed on the spot, but cargoes are often sent to England, usually in bulk. If new it is more liable to heat than the East India. Rapeseed is produced in almost every part of Europe, but that in the Eastern portions, as Hungary and the Black Sea districts, is usually very inferior, and goes by the name of wild rapeseed. East India seed is shipped in one or three bushel bags ; European seed generally in bulk. Rapeseed is not mentioned in the Baltic rates, but it is referred to in the Report of the Committee on Freights, at the close of the article grain ; settlements are usually made on the basis of linseed, which is rated 10 $\frac{1}{2}$ cent. less than wheat. Bengal ton 20, Madras 18, Bombay 17 cwt. At Calcutta a ton is calculated to measure about 62 cubic feet. A bushel 48 to 53 lbs. ; a last is 10 quarters or 80 bushels. The oil from rape or colza is much used in machinery and in the French lighthouses.

RYE. A bushel 56 lbs.

SAFFLOWER OR CARTHAMUS SEED, sometimes called sursee seed. This is not the article imported as safflower, the latter being a dye made from the saffron crocus leaf. Safflower, the bastard saffron of Bombay. *Carthamus tinctorius*, a crushing seed. *Carthamus Persicus*, a safflower growing in Egypt.

SESAME, SESAMUM, or Gingelie, the *Sesamum orientale*, cultivated in the East Indies. A bushel 48 lbs.

SHADDOCK ; scarcely ever imported into Great Britain.

SHRUB OR TREE.

SURSEE, SURSON, Indian names for varieties of mustard seed, as *Sinapis Nigra*, and *S. dichotoma*. A bushel 52 to 54 lbs.

TARES. A name for the common vetch, *Vicia sativa*, a generally cultivated fodder plant. A bushel 62 to 66 lbs.

TEELSEED, the seed of the *Sesamum orientale* ; see gingelie. Bengal ton for freight 20 cwt., Bombay 17 cwt. A bushel 46 to 48 lbs.

TIMOTHY, a grass seed usually imported from Holland or America ; it is small and requires strong and tight packages. It produces a fine small grass. A bushel 28 lbs. Some sorts 45 lbs.

TREFOIL, a description of clover seed ; it is distinguished from clover by its larger size and yellower colour. A bushel 51 to 68 lbs.

WEIGHTS PER BUSHEL.

Description.	Weight.	Description.	Weight.
	lbs. lbs.		lbs. lbs.
Buck wheat	50@56	Linseed (continued)	
Canary	53--61	Baltic	47@53
Carraway	56	Egyptian	48--51
Clover	60--62	Mangold Wurtzel	20--24
Red	62--66	Millet	56--64
White Dutch	60--64	Mustard	48--55
Cole or Rapeseed	48--50	Niger	45--47
Some kinds.....	53	Onion	36--38
Dari	54--56	Poppy	48
Gingelie	48	Rapeseed.....	48--53
Grass	5--30	Rye	56
Light for sowing ...	16	Sesame	48
Hemp	42--44	Sursee	52--54
Dutch	40--42	Tares	62--66
Lentils	60--62	Teelseed	46--48
Linseed	56--60	Timothy	28--45
Black Sea	49--55	Trefoil	56--60
Bombay	50--52	Some sorts	68

UNITED STATES' WEIGHT OF A BUSHEL AND NUMBER OF SEEDS IN A POUND.

Description.	No.	Weight.
		lbs. lbs.
Wheat	10,500	54@58
Barley	15,400	46--48
Oats	20,000	33--42
Rye	23,000	56--60
Canary Grass	54,000	56--60
Buck Wheat	25,000	48--55
Turnip, Swede	155,000	50--56
Turnip, Cornish Holdfast	230,000	50--56
Turnip, Orange Jelly	133,000	50--56
Cabbage, Scotch Drumhead ...	128,000	56
Cabbage, Drumhead Savoy ...	110,000	50--56
Clover, Red.....	249,600	60
Clover, White	686,400	59--62
Rye Grass, Perennial	314,000	26--28
Rye Grass, Italian	272,000	13--18
Sweet Vernal Grass	923,200	8

1003. The weights of seeds are so variable, and the space occupied by some sorts so little known, that both for the purpose of chartering and of stowing, a table of comparative weights and capacities has been prepared. In using this table (see next page) it is necessary to remember that a large quantity of seed will, by comparison, occupy less space in the hold than when measured in small portions, and that when packed in bags or pockets, more space may be necessary. The gain by compression of a quantity of wheat, 61·2 lbs. $\frac{1}{2}$ bushel, is about 7 $\frac{1}{2}$ cent., and by stowage, where measurement goods cannot be stowed, 8 $\frac{1}{2}$ cent. total gain 15 $\frac{1}{2}$ cent.

**Table of Weights per Bushel compared with Measurement Tons ;
and of the cubical contents of a Ton of 20 cwt.**

Weight per bush.	Freight ton of 40 cub. ft.	Freight ton of 50 cub. ft.	Ton of 20 cwt.	Weight per bush.	Freight ton of 40 cub. ft.	Freight ton of 50 cub. ft.	Ton of 20 cwt.
lb.	lb. dec.	lb. dec.	ft. dec.	lb.	lb. dec.	lb. dec.	ft. dec.
5	155.802	194.753	575.086	58	1651.507	2064.384	54.253
6	186.968	238.704	479.239	4	1682.668	2103.384	53.248
7	218.123	272.654	410.790	5	1713.828	2142.285	52.290
8	249.284	311.605	359.429	6	1744.989	2181.286	51.347
9	280.444	350.556	319.492	7	1776.149	2220.186	50.446
				8	1807.210	2259.137	49.576
				9	1838.470	2298.088	48.736
10	311.605	389.506	287.543				
11	342.765	428.457	261.408	60	1869.631	2337.088	47.924
12	373.926	467.408	239.619	1	1900.791	2375.959	47.138
13	405.087	506.358	221.186	2	1931.952	2414.909	46.377
14	436.247	545.309	205.387	3	1963.112	2453.860	45.641
15	467.408	584.260	191.695	4	1994.273	2492.841	44.928
16	498.568	623.210	179.714	5	2025.433	2531.792	44.237
17	529.729	662.161	169.143	6	2056.594	2570.742	43.567
18	560.889	701.112	159.746	7	2087.754	2609.693	42.917
19	592.050	740.062	151.388	8	2118.915	2648.644	42.285
				9	2150.075	2687.594	41.672
20	623.210	779.013	143.771				
1	654.371	817.963	136.925	70	2181.236	2726.545	41.077
2	685.531	856.914	130.701	1	2212.396	2765.495	40.499
3	716.692	895.865	125.108	2	2243.557	2804.446	39.936
4	747.852	934.815	119.809	3	2274.717	2843.397	39.389
5	779.013	973.766	115.017	4	2305.878	2882.347	38.857
6	810.173	1012.717	110.593	5	2337.038	2921.298	38.339
7	841.334	1051.667	106.497	6	2368.199	2960.249	37.834
8	872.494	1090.618	102.693	7	2399.359	2999.199	37.343
9	903.655	1129.568	99.152	8	2430.520	3038.150	36.864
				9	2461.680	3077.101	36.397
30	934.815	1168.519	95.847				
1	965.976	1207.460	92.755	80	2492.841	3116.051	35.942
2	997.136	1246.420	89.857	1	2524.001	3155.002	35.499
3	1028.296	1285.371	87.134	2	2555.162	3193.953	35.066
4	1059.457	1324.322	84.571	3	2586.322	3232.903	34.643
5	1090.618	1363.273	82.155	4	2617.483	3271.854	34.231
6	1121.778	1402.220	79.873	5	2648.643	3310.804	33.828
7	1152.939	1441.174	77.714	6	2679.804	3349.755	33.435
8	1184.099	1480.124	75.669	7	2710.965	3388.706	33.051
9	1215.260	1519.075	73.728	8	2742.125	3427.656	32.675
				9	2773.286	3466.607	32.308
40	1246.420	1558.026	71.885				
1	1277.581	1596.976	70.132	90	2804.446	3505.558	31.949
2	1308.741	1635.927	68.462	1	2835.607	3544.508	31.597
3	1339.902	1674.877	66.870	2	2866.767	3583.459	31.277
4	1371.062	1713.828	65.350	3	2897.928	3622.410	30.940
5	1402.223	1752.779	63.898	4	2929.088	3661.360	30.612
6	1433.383	1791.729	62.554	5	2960.249	3700.311	30.267
7	1464.544	1830.680	61.224	6	2991.409	3739.262	29.952
8	1495.705	1869.631	59.904	7	3022.570	3778.212	29.643
9	1526.865	1908.581	58.682	8	3053.730	3817.163	29.341
				9	3084.891	3856.113	29.044
50	1558.025	1947.532	57.506				
1	1589.186	1986.483	56.381	100	3116.051	3895.664	28.754
2	1620.347	2025.433	55.296				

 See explanation on the preceding page, and the article grain.

1004. SENNA LEAVES in bags, and various kinds of leaves, require to be kept quite dry, as they are very liable to ferment and mildew ; being easily bruised and broken, they should not be handled roughly. Stow at a distance from all substances containing saline matter, or those likely to generate moisture. Senna must not be placed too near aloes or drugs of a similar description, or it will become impregnated with the scent. Bengal, Madras, and Bombay ton 50 cubic feet senna ; Bombay six cwt. in bags.

1005. SHARKS' FINS. Madras ton 16 cwt.

1006. SHELLAC ; see the articles gumlac and lac. Bengal and Madras ton 50 cubic feet, 16 cwt. in bags. A chest one to three cwt.

1007. SHELLS : Bombay ton 20 cwt. rough sea shells in bags. Nine tons of mother of pearl shells from Western Australia, shipped at Melbourne, 29th July, 1868, in the *Jerusalem*, Capt. LARGIE, were contained in four casks, sizes 2/11, 2/3, 2/3, and 24 cases of different sizes, none exceeding three feet the largest way. Bags of pearl shells are generally used at Sydney to fill up the cargo near the hatches, as they are not liable to much injury from leakage.

1008. SHIRTING. A bale of English shirting, by the Chinese laws, contains 50 pieces.

1009. SHUMAC requires to be well trodden down. Unlike flour it is very porous and will readily imbibe dampness, even from the ship's side, unless well dunnaged ; water will run into shumac until its nature is gone and it becomes quite hard. During the passage of a ship from Dunkirk to Dublin, flour in sacks stowed on shumac became damp and discoloured, and was in consequence much deteriorated. In most parts of the Mediterranean 14 bags go to a ton, either by weight or measurement ; when wheat is freighted at 1s. $\frac{1}{4}$ quarter, shumac in bags is rated at 5s. 6d. $\frac{1}{4}$ ton of 20 cwt. It is ordinarily packed in bags 14 cwt. each. At Lisbon a last is 3,600 lbs.

1010. SILK. China raw is packed in small bales, one cwt. each, covered with a kind of matting made of cane ; Cashmere shawls in camphor wood lined with tin or zinc, and strewed with pepper and other spices. When in the same hold with teas, it is usual to select the most dry and secure place for stowing, say between the fore and main hatches ; this is then called the "silk room," and is formed with boxes of tea on each side. Silk must be kept clear of the corners of hatchways and combings, from masts, stanchions, hold pillars, &c., all of which should be well dunnaged and matted ; it must never be placed near the sides, to avoid leakage from bolts or

fastenings of any kind, which will greatly damage it, and particular care must be observed not to stow near packages likely to chafe; neither must raw silk in bales be screwed when stowed, or the gloss will be destroyed, and as moisture is contracted in the hold, the silk will become almost as hard as a brick if screwed. At Singapore it is dunnaged under with rattans, and covered with several layers of mats. At Calcutta and other ports, where procurable, loose dry hides are preferred.

1011. In consequence of the oxidization of the metal (tin, &c.) in which certain corahs or East India silk piece goods were formerly packed, that practice has been abandoned, as wherever the oxidation occurred, a red stain was produced, which on touching the cloth rotted it entirely. They are now packed in cases of teak or hard wood, pitched inside to exclude air, and well lined with wax-cloth and calico; covered outside with gunny and roped. These goods are still dressed with a mixture of rice, sugar, and arsenic, which produces mildew and generates worms if packed in a damp atmosphere; they therefore require special care on a long voyage. Silk is computed to lose 4 $\frac{1}{2}$ cent. in weight between Canton and England. As the shipments in Bengal and Madras generally include large quantities of sugar, saltpetre, and other goods, which produce exhalations, silks shipped there are stowed in the 'tween decks or in spare cabins. It is exported thence all the year round. **Japan** waste silk (the combings after the silk is drawn) emits an odour highly injurious to teas, &c. In Japan during 1860-61, 9,055 piculs of silk were sold at an average of \$372, making £870,548, while in 1867-68 the price had increased to \$741, and the total value of 9,845 piculs was £1,630,591. In 1868-69 the price had advanced still further to \$800, and the exports 12,400 piculs to £2,252,666. Since 1861 the dollar fell from 5s. 2d. to 4s. 6 $\frac{1}{2}$ d. The silkworm suffered much in 1869 from a parasite called "uji" maggot, which is annulated, without feet, and when of full size, sometimes as large as the silkworm chrysalis. It is conjectured that during the spring, a fly deposits on the mulberry leaves its eggs, which being eaten by the silkworm, become uji in its intestines. After the formation of the cocoon, the uji kills the chrysalis on which it has been feeding, pierces the cocoon and renders it useless for anything but floss silk.

Tonnage. About 8 to 8 $\frac{1}{2}$ bales raw silk go to a ton of 50 cubic feet; in some cases 7 bales. Bengal, Madras, and Bombay, 10 cwt. raw silk in bales; Bombay, 50 cubic feet in cases; Bengal and Madras, 50 cubic feet silk piece goods. A box containing 9 bundles raw silk, Chinese, measures 7'112 feet, of which 7'216 boxes go to a ton of 50 cubic feet; for other Chinese measurements for freight, see the table at the commencement. New York ton 8 cwt., Baltimore 900 lbs. China raw.

Measures. Egyptian silks are measured by the pic. 26·8 English inches. The Grecian short pica for silk is 25 inches; the Grecian pound for silk is 1·5th heavier than the ordinary pound, and contains 15 ounces or 166 $\frac{2}{3}$ drachms. A Turkish teffe or taffe 4·32 lbs.; Levant, variable, 800 drachms, each 49,600 grains troy; India pukka-seer 1·866 lbs.

1012. **SILVER.** Large quantities are imported in plano-convex bars, two feet long, six inches broad and thick; $\frac{3}{4}$ cwt. each. Boxes of Mexican specie are marked MD., dipthong fashion. *Bar silver* and Bolivian *dollars* are shipped all the year round at Cobija, which is the nearest port to Potosi. It is brought down from the mountains on mules and asses—the dollars in bags, the bars loose. Cobija is also the sea-port of Chuquisaca and Salta in Bolivia. When shipped in the shape of coin, as dollars, from Mexico, Peru, Chili, and various ports, they are packed in cases, varying in size to suit the quantity contained; see gold. On board the mail steam-ships, it is stowed in the specie room, or in the hold if a large quantity.

1013. **SKINS.** 7·2727 tons dried skins occupy a space of 850 cubic feet, or one keel. Bengal and Madras ton 50 cubic feet. A timbre of small skins should be 40 or 50, packed between two boards; with some skins the timbre counts 120.

1014. **SMALTZ OR SMALT,** an oxide of cobalt, melted with silicious earth and potash, and manufactured principally in Germany and Norway. A barrel weighs three cwt.

1015. **SMILAX.** Forty bales were shipped in June, 1866, at Colombo, in Ceylon, on board the barque *Cape City*, Capt. JAMES BAWDEN, who describes it as a kind of herb something like sarsaparilla, for the use of which it is substituted. The bales were hydraulic pressed, packed in gunny cloth, and banded with iron hoops $3 \times 2\frac{1}{4} \times 2$ feet, weighing about 200 lbs. each. 50 cubic feet to the ton for freight; they weigh less than they measure. The *Cape City* registers 422 tons, and is $140 \times 27 \times 16$ feet; partial 'tween decks; she is of iron and has three compartments. Her cargo included 592 tons coffee in casks and bags, and coir yarn; with 90 bales cinnamon and 40 bales smilax. The bales of cinnamon were rolls 4 feet 6 inches long by 12 inches diameter. **Shipping season** in Ceylon all the year round, but chiefly in February, March, and April.

1016. **SNOW—COAL.** The ship *Erromanga*, chartered to load coal within a reasonable time, except "riots, strikes, or any other accidents beyond their control;" a heavy fall of snow caused delay, and on an action for demurrage (22nd February, 1868, Common Pleas), defendant, SCHAWLZ, pleaded the fall of snow, but the court

gave judgment in favour of plaintiff, FENWICK, as the fall of snow in that part of the year was not an unusual occurrence.

1017. SOAP is not liable to injury either from heat or cold ; marine soap is more liable to injury from salt-water than household soap. Soap boxes being square, should, if possible, be all packed together ; they are strong enough to carry their contents from one port to another, but will not bear a blow from the end of a cask, neither will they bear such casks or other heavy goods to be rolled over or rested on them. For **Australia**, the boxes are usually strengthened, and for toilet soap they are sometimes lined with tin. In the spring of 1862 two vessels went from London to the West Indies having general cargoes, including several boxes said to contain soap. During the passage the contents dissolved, leaked on, and damaged and impregnated other goods, causing a claim on the masters which they paid under protest. There is no rule regarding the sizes of chests of soap ; in London they contain 4 cwt. and 5 cwt. each ; in other manufactories the sizes are confined to 1 cwt., 2 cwt., and 3 cwt. each, the largest chiefly for home consumption, and the lesser for exportation. Seven chests of 3 cwt. sometimes go to a ton.

Sizes. The sizes of boxes are : 1 cwt., $24 \times 16 \times 12$ inches ; 2 cwt. 2 feet 9 inches \times 16 inches \times 16 inches ; and 3 cwt., 3 feet 9 inches \times 1 foot 4 inches \times 1 foot 4 inches.

Tonnage. The Admiralty allows 11 half-hogsheads of soap, 24 small casks, or 24 small casks second size and barricoes, to a ton. Bengal, Madras, and Bombay ton 50 cubic feet in cases ; Bengal and Madras 20 cwt. in bars, 15 cwt. in bags. In computing the freight of boxes of soap at Baltimore, 200 lbs. net weight are considered equal to a barrel of 5 cubic feet. For the Admiralty weights of barrels of soap, see the tables at the commencement. Ordinarily a firkin of soap is $7\frac{1}{2}$ gallons, a barrel 256 lbs.

1018. SODA, crystals of ; dunnage 9 inches, sides $2\frac{1}{2}$. Soda, soda ash, or alkali, is very absorbent of moisture, and is, therefore, subject to increase of weight, or by access of water to be dissolved and destroyed ; having a powerful action on most animal and vegetable substances, it should be stowed clear of them. When loose soda gets into the bilge water, the effluvia has tarnished plates of copper stowed near. Natron, obtainable from the East Indies and from Egypt, is a native form of soda. For injury to nitrate of soda by copper ore, see ores. Mr. B. R. MATTHEWS, agent for LLOYD's at Melbourne, says, 3rd March, 1868—We have had many disputes over damage and stowage, the cargoes being so mixed. The chief articles are soda, and goods that will dissolve from the heat in a ship's hold. A part of the ship should be selected for the stowage of such articles. The packages should be sufficiently safe to hold them ; the

present packages are frail and liable to breakage, from the weight of other goods stowed over them, our ships being much larger than of yore.

1019. The barque *Marinus*, 512·16 tons register, was chartered 11th April, 1864, by Messrs. SHIELD and Co., to load soda, &c., at Newcastle for New York, "say five keel of coals and remainder goods," "£25 for goods and £20 coal; 16 days to load; to discharge 50 tons per working day" The merchants guaranteed to put the ship as the master wished, but in that case the owners to employ stevedore recommended by SHIELD & Co. The coal was spread fore and aft; anchors and chains amidships on the coal; leads next; then sodas; the bleaching powders being light, were stowed forward. She would have taken 40 tons more. Her draught on departure was, aft 17 feet 4 inches, forward 17 feet; and on arrival 17 feet 4 inches and 16 feet 10 inches. The staves of casks of bleaching powder from Newcastle to New York, are often found on arrival to be so rotten that the contents have to be dug out of the hold by men who require to be paid a high rate of wages; the cost of new casks and cooperage falls heavily on the ship.

Tonnage. 16 tons soda in casks, or 21 in bulk, occupy 850 cubic feet or one keel. When wheat is 1s. $\frac{7}{8}$ quarter freight, soda and other alkalis are 6s. 10 $\frac{3}{4}$ d. $\frac{7}{8}$ ton in casks, and 4s. 7 $\frac{3}{4}$ d. in bulk. Soda is packed in casks of 2 to 6 cwt.

1020. SODIUM-AMALGAM. The *Boston Journal* says, the master of the *St. Joseph*, recently arrived at this port, having found a suspicious box on board, marked "sodium," flung it overboard, and as soon as the package touched the water an explosion occurred, lifting the sea into an immense column. We infer from a San Francisco journal that it was a new chymical mixture called sodium-amalgam. It is never manufactured in very large quantities, though it has been advertised for sale in San Francisco, one firm claiming to have as much as 200 ounces. The amount does not seem large, but when it is understood that the explosive power of one ounce is equal to that of 25 lbs. of gunpowder, or 2 $\frac{1}{2}$ lbs. of nitro-glycerine, it can readily be conceived that even 15 ounces or 20 ounces exploded in one place, would create immense havoc. And when one further reflects that even so little a thing as a spoonful of water coming in contact with 200 ounces of sodium would occasion an explosion equal to that which would be caused by the ignition of 5,000 lbs. of powder, or the concussion of 500 lbs. of nitro-glycerine, we can form some conception of its tremendous destructive power.

1021. SORGHO or *Sorghum Saccharatum*, or *Sorgho à sucré*, a grain-bearing plant, a native of China, cultivated in the south of

France ; it grows 9 feet high, and produces four to six stalks, each having a bunch containing 2,000 to 3,000 seeds ; the stalk produces sugar and alcohol ; the green leaf is eaten by cattle. Indian millet is a variety of sorgho imported from Turkey and other places, often under the Turkish name of *Dari* (a corruption of the Arabic *dhurra*), and is well known in the West Indies as Guinea corn, and at the Cape as Caffre corn ; this variety is also cultivated in China, and latterly in Australia.

1022. SPAIN—**Bilbao.** Rate of Exchange at Bilbao and ship freights. The Board of Trade have received a despatch, of which the accompanying is a copy, from Her Majesty's consul at Bilbao, relating to rate of exchange at the ports in that consulate, and the terms upon which vessels are chartered to convey cargoes to those ports :—H.B.M. Consulate, Bilbao, 16th July, 1869. Sir,—I have the honour to submit for the consideration of the Board of Trade a matter of some importance to British ships trading with ports of this consular district, regarding rate of exchange and payment of freights.

My attention has frequently been drawn to certain charter-parties engaging vessels to convey cargoes from British ports to Bilbao and San Sebastian, in which the following printed clause is inserted :—“ Freight to be paid in cash at the exchange of 52 pence per Spanish dollar.”

I believe that the insertion of this clause could only be permitted by shipowners and masters in complete ignorance of the subject of exchange ; and as considerable loss is entailed upon vessels chartered upon such terms, it would appear desirable in the interest of British shipping that the following facts should be made public :—

Fifty-two pence to the dollar is a rate which is never known here ; it is equal to $92\frac{1}{2}$ reals $\text{₤ } \text{₧}$ sterling. The rate of exchange between these ports and England for many years past has ranged from $95\frac{1}{2}$ to 100 reals $\text{₤ } \text{₧}$ sterling, and the present exchange at sight or short date, is about $96\frac{1}{2}$ reals $\text{₤ } \text{₧}$ sterling.

Every ship, therefore, which of late years has accepted the condition in question, has been subjected to an unnecessary loss on the freight varying from $3\frac{1}{4}$ to 6 ₤ cent.

The subject is one which our shipmasters do not generally comprehend, and I, therefore, beg to suggest, for their protection in future, that the clause in charter-parties with respect to payment of freight should be simply—“ Freight to be paid in cash at the current rate of exchange.”

(Signed)

HORACE YOUNG, Consul.

1023. SPELTER, built up in a column, near the after scuttle, has been found very convenient for trimming East India merchant ships at sea, as the labour of removal is not great. Spelter and tile copper require to be stowed closer than railway bars, as they are more liable to shift in bad weather, still they may be stacked a little apart. On the passage from Stettin to London, on board a steamship, spelter stowed upon oats had caused them to become heated and discoloured ; see oats.

1024. 8PICES. Bombay candy 588 lbs.

1025. SPIKENARD. E. I. Co.'s ton 10 cwt.

1026. SPIRITS and WINES in casks should be stowed bung up ; to have good *cross beds* at the quarters, *and not to trust to hanging beds*, to be well chocked with wood, and allowed to stow three heights of pipes or butts, four of puncheons, and six of hogsheads or half-puncheons. The bilges of casks should be not only free below, but what is termed "finger free" from each other. Capt. PARISH, E.I.Co. says—"they may be stowed close until the longer is completed, and then wedged off by driving quoins on each upper quarter. If the casks are not exactly a fore and aft line, the chimes will lock and get broken in breaking them out of their places. The space between casks should be filled up just high enough for the beds to rest upon, that the strain from the upper heights may not fall entirely on the lower casks." One experienced master says—"in flooring a ship, I recommend that all casks of liquids have four beds,—if spirits or wine, you *must* put four. If a cask is laid upon two beds it bends between them, and the bilge settles down on the skin when under pressure and thus breaks ; or, if the beds are high, the bilge staves break outwards. But when four beds are put properly under hogsheads or puncheons, and six under pipes or butts of wine, bung up and bilge free, well quoined on the beds and quarters, they cannot start and will bear almost any weight ; when a cask is bilge free, it must not only be free of pressure from beds laid under it, but must also be free from pressure on the bilge on each side and on the top. It must be bung up for then the pieces of the head are perpendicular and will bear a great strain ; but if the cask slues only half a stave there is danger of the head shifting with very little pressure,—an old cask might do it by its own weight. To stow bilge and bilge, with hanging beds and quoins, half a cargo of wood would be wanted, and consequently there must be great waste of space. Stowing wine and spirits in the second tier, care must be taken to have the bilge of the casks protected from the stanchions, as if they are not blocked

off and quoined, there is danger of leakage from undue pressure. Also in stowing bales and cases on the top of casks, the weight must be kept off the bilge by pieces of wood athwart the quarters of the casks. With regard to the trouble and expense of bedding and quoining, if you do as I suggest you will land your casks in good order, if not there may be leakage, and remember one cask of brandy will cost £40: how many beds and quoins will £40 pay for?" When a cask or case bursts, no lighted candle should be brought near, for the vapour which rises is highly combustible. As soon as a cask is in the slings of the London Dock Companies to be hoisted from the hold, the companies become responsible, and continue so while it remains in the docks, and until it is in the merchant's cart. The company is not responsible for a loss of less than one gallon per cask per annum, it being considered that this may arise from natural evaporation and leakage; and thus if a cask of 100 gallons was housed 31st December, 1861, and taken away 30th December, 1862, the quantity being found on re-gauging to be 99 gallons, the merchant could make no claim; but if 98 gallons, he would be entitled to send an invoice to the company for one gallon. For slinging, see mate; for stowing, see protest and survey; for bottles, see glass. In using SYKE'S hydrometer, the officers of Customs usually require for French brandy what is termed a weight of 60; West India rum 30 to 40; Geneva (Hollands) 70; and for whiskey variable. Spirits lose in quantity by being stowed in a very dry place, and gain in a damp locality, but suffer loss of strength; the extreme is said to exceed two gallons in a puncheon; the strength decreases in a high temperature. During the prevalence of the harmattan, on the west coast of Africa, iron-bound casks require the hoops to be frequently driven tighter, and a cask of rum or brandy can scarcely be preserved; unless kept constantly moistened the hoops drop off.

1027. All spirits, &c., whether for ship's use or for freight, should be received and struck down below with as little delay as possible, to avoid the surreptitious use of the gimlet and reed. Whenever wines or spirits are stowed with general cargo, a bulkhead of other goods should, if practicable, be built against them, that there may be no temptation to plunder. They should be stowed in emigrant ships in such a manner that neither crew nor passengers can by any possibility get at them. Instances have been known where the crew have cut through the fore-castle bulkhead, and the emigrants have cut holes through the 'tween decks into the hold, and after working for days have reached the wines and spirits. Keep at a distance from salt, which will reduce the strength; and from guano, grain, flour, oil-

cake, sugar, or any other heat-producing goods, which will cause the casks to leak. For further stowage information see ammunition, casks, general cargo, liquids, mate, oils, and passengers, the last of which includes the government regulations for drawing off spirits. Spirits for ship's use should, if possible, be drawn by daylight. In the Navy, a reflector glass lantern is found to be safer and is much more illuminating than one of horn; sometimes a looking glass will be found sufficient. Many lives have been sacrificed through accidental fire when drawing spirits by candle light in the lazarette; it is suggested as preferable to have a small place, even a sleeping berth in the cabin, appropriated specially for the purpose; or that the strength of spirit for daily consumption, should be previously reduced with water. The temperature of a ship's store rooms and spirit room in the tropics is from 80° to 85° , and at this temperature, nothing can prevent the bursting of the casks by the expansion of the spirit, if they are full to the bung. The Passenger Act, 1855, inflicts a penalty of £20 for selling spirits to passengers.

1028. **Brandy.** Proof brandy is considered proof by the custom-house authorities if containing 50 $\frac{1}{2}$ cent. of alcohol, when the temperature is 51° Fahrenheit. It weighs $\frac{11}{16}$ ths of an equal quantity of distilled water. A schooner which now registers 82 tons and formerly 90 tons, with depth of hold over 10 feet, beam 19 and a fraction, length from bulkhead to bulkhead $43\frac{1}{2}$ feet, stowed a cargo of Charente brandy, consisting of 123 hogsheads (60 gallons), 139 quarter casks (30 gallons), and 1,600 square cases, each containing one dozen quart bottles. Brandies and other spirits for the Australian colonies are generally in hogsheads and quarter casks, or packed in straw in cases containing one dozen each.

1029. **Rum** evaporates more rapidly than any other spirit. The strength, say 32° over proof on importation, has been known to be reduced 8° or 10° after being twelve months in an ordinary store. The closer the store, the more hermetically sealed, the better. A draught of air will greatly increase evaporation. This will show the necessity of keeping rum in a ship's hold well closed. A moist atmosphere does not so much promote evaporation as a dry wind. The flavour of rum is, however, always improved by heat; hence importers are glad to have their cargoes in sugar ships which generate heat, and do not evaporate largely in a well-closed hold, and in comparatively short voyages. Rum can only be imported in ships of at least 50 tons burthen, and in casks of not less than 20 gallons, or bottles not exceeding three pints. Large quantities are shipped in December at Calcutta, chiefly in old beer hogsheads; in stowing the

lower tier there, puncheons are placed in the broad spaces, hogsheads in the narrow ; cover the quarters of the casks with teak slabs not less than one inch thick, and bring it thus right up to the beams. Special attention is necessary when stowing rum in the East Indies. It is often injured by being placed under native sugars, the weight of which damages the casks ; instances have occurred of good strong ten-hooped puncheons, stowed on the ground tier, having come out of the hold completely crushed, and doubled up like a cocked hat. Importers prefer having rum stowed fore or aft, say four heights, with light goods to fill up, and the sugars amidships. The heat from new sugars placed close to casks of rum slackens the hoops, and leakage, of course, ensues. When the head of a hogshead of sugar, with the heading not too tight, has been placed in the hold of a coasting vessel end on to the head of a puncheon of rum, the rum has been drawn through to a depth of two or three inches in discoloration of the sugar. The steam from rum is said to be prejudicial to the health of the crew. When rum is imported in casks made of proper oak, the London Dock Companies engage to be responsible for deficiencies in measure which shall exceed one gallon per cask for each year, or a fraction of a year, the goods remain in charge ; but the companies will not be answerable for deficiencies arising from the casks being made of other and inefficient materials. In the West Indies the **shipments** for rum and sugar are usually from the middle of February to the end of October ; the new crop comes in late in February or early in March, when the principal shipments take place.

1030. The ship *Duchess of Leinster* was destroyed by fire in the island of Tobago, 7th May, 1863. She was loading rum, and the bulkhead which divided the fore-castle from the fore-hold, had been double-planked to strengthen it, but this was unavailing. The crew broke through, and it is supposed that the rum got ignited from a lighted candle which they were using. One of them, SAMUEL PIERCE, was burnt to death, and another, HENRY STROOD, much injured. The master and mate were in the cabin making up the account of the cargo. They rushed forward and went below, but were soon driven back by the smoke and flames. The ship was towed to a beach where she was totally consumed, her destruction being hastened by the explosion of the puncheons.

1031. **Gin** from Holland is occasionally sent to Australia in square glass bottles, packed with husks, in cases so weak that the husks run out and the bottles are very liable to break. Gin is often insufficiently corked ; the cases should be stowed covers up or leakage will probably occur.

1032. **Wines.** Some wines are so delicate that they will not bear exposure to extreme heat or extreme cold. For this reason the best seasons for their removal in France are spring and autumn, when the weather is temperate; some object to the landing of sherries and other delicate wines in England in very cold frosty weather, such as that which prevails in January. Ports are said to be injured by exposure to extreme cold; the French say that the delicate wines of Bordeaux are injured by voyages at sea. Madeira, Sherry, Canary, Malaga, Syracuse, Cyprus, and some others, keep better in warm cellars. Portugal wines can be placed under the most frequented streets of the metropolis, while those of Bordeaux, Champagne, and the Rhone, must be kept where no motion can affect them. In a well-arranged wine cellar no cask is suffered to touch its neighbour or the cellar wall. No fruit, flower, garden produce, or green wood, is permitted in the cellar, for fear of imparting a disagreeable taste to the wine. Some qualities, delicate sherries especially, are wonderfully susceptible of all that impregnates the air around them; there are connoisseurs who go so far as to imagine that unless the cellarman is in a perfect state of health, the delicacy of the wine may be affected, or at any rate that it will be injured if he is suffering from some disorders. Many good wines are ruined by being allowed to remain in cask in a wet cellar, upon the ground, without a free current of air all round the cask. Great care is necessary on board ship to avoid proximity with humid and vapour-producing goods, several of which are enumerated in the article spirits. Casks of wine from the East Indies are generally capable of bearing their own weight; an empty cask will not bear one-tenth the pressure of a full cask. Casks of wine in hot countries are, like unprotected bottles, liable to perforation by ants, and to lose their whole contents. It is said that the quality of wines in bottles is injured or destroyed after musk rats have passed over them, unless the corks are covered; see vermin. In Spanish ports, when wines are some time on deck before they can be struck into the hold, the casks are placed on end, their heads covered with water, and a canvas awning is spread over all. If the hoops of wine casks become wet with salt-water, they become brittle, after drying, and burst. **Montilla** wines should not be shipped during the hot months of summer; they are in casks of the same size as Sherries, and stowed in the same manner. The percentage of proof spirit in the best **Port** may be taken at 33 $\frac{1}{2}$ cent. All **Clarets**, low classes especially, should be stowed with the bungs sufficiently inclined to keep wet—a practice always observed in the warehouse by the trade, to prevent excessive evaporation. At Bor-

deaux, masters should be careful in selecting casks of claret; they are all weakly made, and great caution is necessary when stowing. The cheap **Vins Ordinaires** (*vaing or-de-nayre*) require special care; having no iron hoops they should always be placed in the upper tier. **Bordeaux** merchants recommend that in the cellar a cask should be so placed that the bung is on its side and covered with the wine, to prevent the air from penetrating. The Chamber of Commerce there, in 1866, decided that the *barrique* must contain 226 litres 25 centilitres, and the *tonneau* 905 litres, with a toleration of 5 litres in the *barrique*. In **Champagne** the vintage during favourable seasons begins 15th September, but it is more often about 10th October; bottling commences in March. When champagnes have been carried on deck, between Cherbourg and Plymouth, part has been washed overboard and recovered, and all has been wetted by seas breaking over. On landing it was found that the wrapping paper round the bottles was spoiled, and the cork wires rusted; the wine was refused by the consignees. Champagne sent to America is embedded in salt to keep it cool: the cases are very strong and tight. Cockroaches have a great predilection for Champagne, and other light wines, and unless the corks are covered with tinfoil or metallic capsules, they will eat through and waste the contents of the bottles; many champagnes, like the sherries of Cadiz, are known by the names of the shippers and not by the vineyards. **Tokay** wine ferments in the casks at sea and thus clarifies itself. Wines in bottle, whether capped or not, should be stowed in a dry part of the hold, because there are frequently in the corks small worms in embryo, which are matured by dampness, and diminished by dry and well-ventilated stowage. Among respectable wine merchants the recognised fair bottle is six to the gallon. The specific gravity of Bordeaux wine is '993, Burgundy '991, Constance 1'081, Malaga 1'032, Port '997, and white Champagne '997.

1033. **BORDEAUX.** A ship 321 tons register, loaded at **Bordeaux** and Rochefort, in 1869, for Melbourne and Sydney, the ship to find dunnage and the merchant mats if required. She had a depth of 15 feet, capable of stowing seven heights of quarter-casks (with cases of brandy), and the stevedore refused his certificate unless there was an intervening platform or "flying 'tween deck" laid between the cargo in the lower and upper hold, the cost of which fell on the ship. The wines of Bordeaux (delicate wines) are said to be injured by voyages at sea. The French say so. Many champagne wines, like the sherries from Cadiz, are known by the names of the shippers, not by the vineyards. Pipes of spirits (not hogsheads) are liable to work

round bung down. Masters should not only stow puncheons bung up, but get a certificate to that effect when shipped.

1034. A cause of bad taste in wines arises from the gallic acid in the new oak used in the barrel becoming more or less disengaged. Oak staves for casks are steeped for some days in a strong lye of wood ashes, which prevents the wine from contracting astringency when put together. In some parts of Spain they have a very effectual way of cleaning the inside of the casks, and knocking off all the tartar or other matter. Two heavy chains, joined by a piece of leather, are put into the cask, the bung being driven over the leather so as to enable the chains to be drawn out. A little water having been poured into the cask, it is rolled violently up and down, and every way, so that the chains may strike upon all parts of the interior. Water is then put in, until it comes out perfectly clear, when the cask is well rinsed with wine, and a sulphur match burned inside. The produce of the vineyards in the Cape Colony is brought to market in September, October, November, and December.

1035. **Spirits in Bond.** In December, 1866, Capt. C. VAN T HOFF, of the Dutch steamer *Fyenoord*, complained to the *Shipping Gazette* that in December, 1865, he delivered a cask of wine in good order, and it was entered by the Customs' officer in his blue book. On the 19th December, 1866, he was summoned to the Sheriff's Court, and upon a lighterman's statement only, it was decided that damage had occurred through leakage. The Editor answers that a cask, when in bond, is conventionally held by the Customs to be on the voyage; and on the owners declaring their intention to clear it, and paying duty, contents are gauged. If there is less wine than on the manifest, the servants of the Crown exact the full duty, unless they are satisfied that the loss has been caused by leakage. A memorandum is made, and on being duly certified, the duty is levied on the actual quantity in the cask. No distinction is drawn between leakage in the ship or whilst in bond.

1036. **Deficiency.** A master asks the *Gazette*, 27th June, 1864: "A French ship from France arrives in Scotland, June, 1864, with a cargo of brandy, &c., in casks, several of which are found to be not full. Surveys are held, and evidence is given that the cargo is all bung up, well bedded, bilge free, and grounded off on both sides; but the surveyors are of opinion that the leakage arose from the casks being stowed bilge and bilge, instead of bilge and cantline. The receivers deduct from the freight full value of short of being full, although the master declares on oath, that all he took on board he has put on shore, and can account in no other way for the leakage,

if leakage there has been, than by the roughness of the voyage ; and as for the stowage, it was under the direction of shippers, by agreement. Bill of lading, "not accountable for leakage." Would you inform me as to my responsibility, and whether the acts of the receivers of the cargo are justifiable, and what course I should pursue? I have protested against the receivers of the cargo, holding them responsible for all losses. The receivers of cargo also deduct from freight surveyors' fees in full." The Editor answers: "The master has done right in protesting against the conduct of the consignees, and in serving them with notice. However the loss by leakage may be eventually settled (and it appears to us that the ship is exempt from the same), the consignees have clearly no right to deduct anything from the freight of that portion of the cargo delivered in good order and condition. To do so amounts to this: first, to make a claim which may or may not be a just one when enquired into; secondly, to make a fund for the satisfaction of such claim, if found just, out of moneys belonging to another person, viz., the owner of the freight; thirdly, to decide without judge or jury that the claim is just; and, lastly, to apply the fund so arbitrarily made in payment of a claim which is really all the time unadjudicated upon and disputed."

1037. **Wine—Freight.** A master writes to the *Shipping Gazette*, 29th July, 1857: "My vessel arrives with wine, freight payable at per tun of 252 gallons. The officers of Customs furnish particulars of quantity on which the Crown receives duty, and on that quantity the merchant proposes to pay freight. Is he not liable to pay on the entire quantity in each cask, the ullage of which is usually a gallon or more?" The Editor answers: "There is no Customs' allowance on wine; the duty is paid on the quantity actually delivered, and so should the freight. It happens frequently that the shipping and landing gauges do not agree. It once occurred that where 1,636 gallons Marsala were invoiced, the gauge made it 1,567 gallons, on which of course the duty and freight were paid."

1038. **Whiskey.** In the Appeal, House of Lords, 9th March, 1868, *MAC FARLANE v. TAYLOR*, it was stated that the respondents, in 1862, required a quantity of coloured whiskey to barter on the West Coast of Africa, for palm oil, &c., and the appellants contracted to supply 20,000 gallons, coloured with burnt sugar, at 1s. 4d. $\frac{1}{2}$ gallon. At Old Calabar, early in 1863, there was a merry-making among the natives, at which a quantity of the whiskey in question was used. About one o'clock the following morning, FANG-O-FANG, one of the African chiefs, came on board the vessel in great terror, and said he thought there was poison in the whiskey. It turned out that it had been coloured with a preparation of logwood instead of with burnt sugar, and the result was that the

saliva, urine, and other secretions of those who partook of it were dyed a blood-red. This effect greatly alarmed the natives, who refused to exchange their goods for such spirits, and the respondents consequently lost the season's trade. They assessed the damages at £6,000, and the jury who tried the case, found a verdict in their favour for £3,000. The question now came before their lordships upon a technical point of Scotch law.

1039. **Improper Stowage.** Queen's Bench, 4th July, 1865. Before Lord Chief Justice COCKBURN. Plaintiff, SANDEMAN, was a wine merchant in the city, and defendant SCARR, was the owner of the barque *Village Belle*.

Mr. BRETT stated that although the amount sought to be recovered was small, yet the principle involved was of considerable importance. In October, 1863, the *Village Belle* was chartered to bring wine from Oporto, amongst which were a number of casks consigned to plaintiff. On discharging, one was damaged, and the wine leaked out, and it would be shown that this loss had arisen through the casks being improperly stowed.

GEORGE EVERLEY, vault keeper, London Docks, found a cask loose on the second tier; it had a shivered stave, and the damage was caused by the working of the cask which was stowed in the tier over, and which was also loose. The casks should have been secured with beds and quoins. A damage like this might have been caused to a cask in the upper tier in rough weather, but he never remembered it to have happened to one before in the second tier. It was a common thing for a cask to leak through a defective stave. The casks sometimes bumped up against each other. If a cask in the second tier had proper quoins and beds it would not shift.

G. BENNET, gauger in the London Docks, deposed that the cask in the second tier could not have shifted had it been properly stowed.

Mr. JULIUS THOMPSON, shipbroker, said he had great experience in the wine trade, and the ordinary weather experienced in crossing the Bay of Biscay in the winter, would not have the effect of loosening the casks if they were properly stowed. Had seen the entries in the log-book as to the weather experienced, and did not think it was the cause of damage. A claim had been made upon the underwriters for the loss, which had been resisted on the ground that the loss did not arise from the perils of the sea.

Mr. E. JAMES, for defendant, said no doubt under ordinary circumstances the owner was liable for bad stowage, but the responsibility may be shifted by the charterer taking upon himself the duty of loading, and so relieving the owner of the liability. In support of this argument he drew attention to the judgment of Mr. Justice WILLES in the case of "*BLAKELY v. STEMBRIDGE*," where the stevedore was appointed by the charterer, although paid by the master, and it was held that the stevedore was the servant of the charterer. This ship's charter-party contained the clause "ship to be addressed to charterer's agent on the usual terms." On arrival Mr. COVERLY, the charterer's agent, provided the cargo, and selected his own stevedore, and the master never interfered. It was urged that the master gave clean bills of lading. It would be found that the vessel was put up as a general ship, and the master signed them in the usual way, but there was the exception as to damage arising from perils of the sea; on the 10th and 11th of February strong gales were encountered and the ship laboured terrifically.

Capt. BOWDEN, of the *Village Belle*, said Messrs. COVERLY were not his agents. The ship had been advertised as a general ship. They told witness that when he

was ready, they would send a stevedore to measure the ship. He had nothing to do with appointing the stevedore, but received cargo from different persons, and signed SANDEMAN'S bill of lading at COVERLY'S office. The ship was American built, broad and shallow, and rolled a great deal. He heard something bumping among the cargo, but he could not get below, the weather was so bad.

The Chief Justice said the question as to the position of the owner in respect to snipper of the goods seemed to him to be more a matter of law for the opinion of the full court. Having given the bill of lading, the question would be whether the owner stood in the same position to the shipper as with the charterer. They could go to the jury upon the fact as to whether the damage resulted from the bad stowage or perils of the sea.

The learned counsel again addressed the jury : The Chief Justice summed up and having briefly dwelt upon the main facts of the case, left the jury to say whether the loss had been brought about by the improper stowage of the cask, or by the heavy weather which the ship experienced. If they should be of opinion that the damage arose from perils of the sea, then it came within the exception, and the defendant would not be liable. The jury, after some deliberation, returned a verdict for plaintiff, damages £22 19s. The Chief Justice said he would stay execution until the defendant could move the full court on the point of law reserved.

1040. **Spanish Wine—Plunder.** Secondaries Court, 23rd December, 1860, **BECK v. WILLIAMS.** According to plaintiffs case he purchased in Spain five butts of sherry, three gold and two brown, which arrived in London and were gauged, and found to be as stated. In November, 1858, the five butts were shipped for a voyage to Calcutta and back, the rate of freight £6 6s. 8d. butt. A provision was made in the bill of lading that the wine might be transhipped into a first-class vessel at Calcutta, but not elsewhere. The voyage usually occupied 12 months, and about November, 1859, when plaintiff was expecting the return of his wine, a notice was left at his office that it had been taken to Amsterdam. He had insured it from Calcutta, but as there had been a deviation it was necessary that he should re-insure, which he did. At Amsterdam the wine was transhipped, and arrived in London by the *Diana*. When wines arrive in the docks, the name of the ship, and where they came from, are recorded, and this wine having been registered as from Amsterdam, and not from Calcutta, its character was much damaged. On the butts being examined it was discovered that the contents had been plundered to an alarming extent ; only one butt had escaped tampering. The surface of the butts were dotted with spile holes, and one had been opened in a much ruder way ; a large hole had been made in it, and had been filled in with hemp and tallow. It did not contain more than half its proper quantity, and the wine was of a greasy description, and water seemed to have been poured in to make up the deficiency. Such was its condition that it could not be gauged by the officers of the London Dock until racked off into other casks. Plaintiff at once communicated with defendants, and it was admitted that the wine had been tampered with, and that the sailors had probably got hold of it. A wish was expressed to meet the case fairly, and the usual notice having been given to defendants, the wine was sold, and plaintiff estimated his loss at £278, after receiving what the wine produced. Plaintiff was examined, and stated that the original cost was £46 10s. a butt, and he valued his two years' profit upon the five butts as £64. The depreciation of character as coming from Amsterdam, and not Calcutta, was put down at £5 a butt. He also claimed

interest, and the amount for re-insuring, and some other small items. The defence was, that the wine had not suffered either in quantity or quality to the extent alleged; and defendant and Mr. HAVISIDE, the broker, were called to show that plaintiff had expressed himself to the effect that he would be satisfied with costs and charges, and it was urged that the plaintiff could not recover both interest and profit. Several parties in the wine trade were examined on behalf of defendants as to the description and value of the wine. The jury awarded plaintiff £278 damages.

1041. **Port—Bad Stowage.** Liverpool, March, 1858, ship *Hazard*, KEWNEY v. JAMES. Plaintiff sued for the value of two pipes of wine which were damaged when being brought from Oporto. On arrival it was found that four casks had been stowed, two each side of the keelson, directly under the main hatchway. Those on the starboard side were in good condition, the others, which were end to end, bore marks of indentation at the two ends joining, in consequence of which nearly all the wine had leaked out. The master said due care had been used in stowing them, but he had had a rough passage, and wine was pumped up. The wine had been insured, and on reference to the underwriters, reasons transpired which led to the belief that the damage had been caused not by the sea, but by careless stowage, it appearing that cases of wine had been placed on the casks, and that the probability was that the damage had been caused by these cases being allowed to fall carelessly on the casks, causing the staves to spring. Verdict for plaintiff, £155. For "wine staved" and "mate's responsibility," see mate.

1042. **Sherry—Leakage.** Before Lord CAMPBELL, Queen's Bench, 28th June, 1858, SIMMONS v. GREEN. Plaintiff sought to recover £140, value of a butt of sherry, contents of which it was alleged had been lost through improper stowage; the butt was placed in the *Nile* for a voyage to Calcutta and back, to improve its quality. It had previously been prepared in the London docks by the coopers, who put a wooden bung in the bung hole, and covered it with lead as a further protection against leakage, and then placed the butt in a case, in the ordinary way. After returning to the East India docks it was found that all the wine had leaked away. Plaintiff alleged that the leakage had taken place through a crack in the "bounge" part of the butt, which had been caused by undue pressure. Defendant contended that the case being too large, the butt turned round in it, the bung-hole coming downwards, and that the wine escaped from the bung-hole, which he alleged was defective, and not from any crack in the body of the butt. The evidence was very conflicting, but the jury were assisted by an inspection of the case and the butt, which were both placed on the floor of the court. Verdict for plaintiff, £140.

1043. **Brandy—Leakage.** At Bristol, July, 1857, MILES sued GERRARD for £27 10s., value of a hogshead of brandy, one of 25 shipped in the *Morning Star*, which had leaked on the passage to Melbourne, where the surveyors stated that "the head was defective; instead of the staves being straight across, so as to form a close and compact head, they were a little awry, and one was too short to fit in the groove of the vent stave." Mr. GERRARD said the cask was new from Charente, and had been three months in bond; his delivery note said "free of all charges on board." The bill of lading said "shipped in good order," and "not accountable for leakage." Plaintiff nonsuited.

Tonnage. 17 tuns of wine, brandy, or any other spirit, reckoning the full gauges of the casks=4,284 gallons, weigh 20 tons, and occupy a space of 850 cubic

feet or one keel. The freight of bottled spirit or wine in cases, is the same as for bottled ale and beer, which see. The Admiralty allows 18 cases wine, one dozen each to a ton. Cases for three dozen measure about 4 feet 6 inches; dry casks, 28 inches long by 19 inches across the head. In measuring for freight it is the practice of the E.I. Co. to take liquid casks, 210 imperial gallons; one-fourth more for covered casks, one-fifth off measurement for bulge. Bombay ton, wines and spirits, in casks or cases, 50 feet. Bengal and Madras ton two puncheons, four hogsheads, 210 gallons, in casks. Madras and Bahia 210 old gallons, in pipes. A case of MARTELL's brandy measures as follows:—length $18\frac{1}{2}$ inches, breadth 17 inches, depth 8 inches; weight 1 qr. $21\frac{1}{2}$ lbs. At New York and Baltimore 200 gallons wine measure, reckoning the full contents of the casks of wine, brandy, or other kind of liquors go to a ton. When Mediterranean wheat is freighted at 1s. $\frac{1}{4}$ quarter, wine in casks is rated at 7s. 6d. $\frac{1}{2}$ tun of 252 gallons. Vessels from Charente calculate 31 cases of cognac to the tun. It is usually calculated that an ordinary ship will take her register tonnage of wines from Oporto or Cadiz, or say 10 $\frac{1}{2}$ cent. over, according to her stowing capacity.

	Doz. bot.
Port—a <i>pipe</i> on an average yields.....	56
Sherry and Tent—a <i>butt</i>	52
Madeira and Cape—a <i>pipe</i>	44
Lisbon, Bucellas, and Carcavellos—a <i>pipe</i>	57
Teneriffe—a <i>pipe</i>	48
Marsala—a <i>pipe</i>	45
Clarets—a <i>hogshead</i> ..	22
Hock and Moselle—an <i>aum</i> of 30 gallons.....	15

WINE CASKS.

Description.	Contents.	Description.	Contents.
	gal.		gal.
Cask of Lisbon	29	Aum of Hock	31
Hogshead Burgundy	44	Quarter cask Port	28
— Claret.....	46	— Sherry	27
— Lisbon	58	Butt of Cadiz	108
— Port	57	— of Sherry	108
— Sherry	54	Vats of Sherry 216 or 218 } gallons, sometimes	250
Pipe Cape	92	Tun (4 hhds. of 63 gallons } or 2 butts 126 gallons) }	252
— Lisbon or Bucellas	117	Admiralty white wine hhd.	54
— Madeira	92	— barrel	36
— Malaga	105	— half-hogshead ...	25
— Marsala 92, some say	108	— kilderkin	18
— Port.....	115	— small cask	10
— Sherry or Tent	93		
— Teneriffe or Vidonia	100		

For Admiralty casks see the article casks.

A double butt of wine contains two pipes, and is ordinarily cased, excepting at Cadiz or Oporto. Fractional parts of a gallon are divided by a custom-house practice into tenths. The standard number of iron hoops required by the London Dock Companies is as follows, viz. : port and Lisbon pipes ten; sherry butts eight; Spanish red, brandy, and Geneva puncheons six; aums, hogsheads, and smaller casks six.

SPIRIT CASKS.

Description.	Contents.	Description.	Contents.
Scotch whiskey punch	gal. gal. 112@130	Havana pipe tafia or rum	gal. 128
Brandy puncheon	110—120	<i>Admiralty</i> rum punch	72
— hogshead	55— 60	— hogshead	54
— quarter cask ...	27— 30	— barrel	36
Geneva piece, about ...	116	— half-hogshead	25
Jamaica rum puncheon	90—100	— kilderkin ..	18
— hogshead	45— 50	— small cask ...	12

Geneva is mainly shipped in hogsheads, quarter casks, and barrels of 65, 32, and 22 gallons.

Wine and Spirit Measure. 4 gills 1 pint, 2 pints one quart, 4 quarts 1 gallon, 63 gallons 1 hogshead, 84 gallons 1 puncheon, 2 hogsheads or 126 gallons 1 pipe or butt, 4 hogsheads or 252 gallons 1 tun.

FOREIGN WINE MEASURES.

AUSTRIA.—70 kopfen one eimer of wine, 3 eimers 1 oxhoft, an oxhoft varies from 44 to 52 gallons. A fass at *Vienna* 127½ gallons, a *Munich* eimer 8½ gallons, *Swiss* 25 gallons. At *Trieste* a polomick 6'6836 gallons; a *caffise* or *caffiso* 2½ gallons.

BATAVIA.—A leaguer 133 gallons.

BELGIUM.—An *Antwerp* boot 152 stoops or about 85 gallons.

BRAZIL.—A canada 12½ pints; a gallon 5 bottles.

CAPE OF GOOD HOPE.—1 flask=6 old gallons or 4'946 imperial gallons; 1 anker 9½ old gallons or 7'9 imperial gallons; 1 aum 38 old gallons or 31½ imperial gallons; 1 leaguer 152 old gallons or 126'6 imperial gallons; 1 pipe 110 old gallons or 91'6 imperial gallons. Tent is usually shipped in the same size casks as sherry.

CANARIES; the same as Spain.

CEYLON.—A canada 2'66 pints.

CUBA.—A bocoy, a cask of wine, 36 gallons.

DENMARK.—A pogle 0'425 pints, a fuder 930 pots, 100 pots 25½ gallons.

FINLAND.—A furdingar 7½ pints; fourth part of the tunna.

FRANCE.—Wines are sold in bottles and also largely in cask; the value reckoned by the litre or hectolitre. A litre is 61'0280264 English cubic inches or 2'113 English pints. A hectolitre is 26'4 English gallons, or 3'531714693 English cubic feet. *Marseilles*, a scandal 3½ gallons; at *Corsica*, a barile 36'985 gallons.

GIBRALTAR.—The duty on spirits is regulated by the strength, according to *SVKE's* hydrometer.

GERMANY.—An oxhoft German hogsheads 44 to 52 gallons; an eimer one-third of an oxhoft; viertel (fourth) for beer and spirit is usually 2 English gallons; and a stubschen liquid 5½ to 6½ pints. Wines: an aum 30 gallons; a fuder (4 oxhoft) 240 stubschen or 196'8 gallons. *Bremerhaven*, 4 ankers=1 tierce, 1½ tierce 1 oxhoft, 1 oxhoft 58 gallons, the aum=4 ankers, 37½ gallons.

HOLLAND.—*Amsterdam*, a leaguer about 126 gallons. 16 flasks=1 anker. *Rotterdam*, a last 5 pieces gin or 8 oxhofts wine.

HAVANNAH.—An arroba=4·1 gallons nearly ; a pipe or tafia of rum 120 gallons.
IONIAN ISLANDS.—30 bozzia=18 English gallons.

ITALY. A fiasco of wine is about 4 pints, and a botta 106 gallons, in some places 246 gallons. At *Genoa*, the barile is 19'6086 gallons, at *Ancona* 11'349, at *Florence* 12'0422, at *Rome* 15'412, at *Naples* 11'573, and at *Leghorn* 12'041 for wine and 11 for spirits ; a *Naples* carro=230½ gallons ; *Neapolitan* caraffa 0'192 gallons ; a caffise or caffiso at *Messina* 2½ gallons. At *Venice* the anfora =4 bigonzi, or 8 mastelli, or 48 sechii, or 192 bozze, or 768 quartuzzi ; it contains 137 English wine gallons ; the botta 5 bigonzi. A flask at *Florence* holds about three quarts. When filled, a little oil is put into the neck, which effectually keeps the wine from the air, as was a custom in ancient times ; when it is to be poured out, a bit of tow is first inserted to draw off or absorb the oil from the surface of the wine.

MAJORCA AND MINORCA.—The quartin 7'168 gallons ; the guerra 3'187 gallons. A Majorca *bdre* 10'679 gallons.

PORTUGAL.—*Lisbon*, almude=4'37 gallons English wine measure ; canado or canado 2½ pints ; an alquiere 3'07 gallons Winchester measure. *Oporto*, a pipe of port 115 gallons=some say a pipe is estimated at the Custom-house (British) as 112 gallons=21 Portuguese almudes ; an almude 4'37 gallons, some 6½ gallons ; an alquiere 3½ gallons Winchester measure ; a last for freight 4 pipes. *Faro*, almude 4½ gallons wine, alquiere 3½ gallons Winchester measure. *Vienna*, almude 6½ gallons wine, alquiere 3½ gallons Winchester measure.

PRUSSIA.—An eimer is more than 18 gallons.

RUSSIA.—A botschka 40 vedros=108½ imperial gallons.

SARDINIA.—The barile contains 8'876 gallons.

SICILY.—*Palermo*, a barile=9'436.

SPAIN.—A cuartella 1'065 gallons ; a cantara 2½ to 4 gallons ; 100 cantaras 356 gallons ; an arroba 4'245 gallons ; a canada 8'68 gallons ; an olla, the fourth of a canada, 2'171 gallons ; a moyo 56'827 gallons. Wine : 4 copas 1 quartillo 0'1105 gallons ; 4 quartillos 1 azumbre 0'4442 gallons ; 8 azumbras 1 arroba or cantaro 3'5380 gallons. A pipe of *Malaga* contains 35 arrobas, but is reckoned only as 34 ; an arroba 4'186 gallons. 4 boats or 5 pipes make a last for freight. A bota of *Pedro Ximenes*=53½ arrobas ; 5 pipes make a last. At *Cadix*, a moyo 16 arrobas ; the botta 30 ditto ; pipe 27 ditto ; the botta 127 English gallons ; pipe 114½ ditto. *Figueira*, almude 5½ gallons wine ; alquiere 3½ gallons Winchester measure. *Valencia*, arroba 3'112 gallons. *Tarragona* and *Marseilles* tun 252 gallons, pipe 126 gallons. In Spain a wine skin made of hog or goat's hide is called *bdre*, dressed with the hair inwards, and pitched or rosined, being more convenient for carrying on the back of a mule, and cheaper than a cask. The bad taste thus communicated, the Spaniards notwithstanding call *olor de bota*, the "smell of the bottle," by custom, and not *de bdre*, of "the skin," as it is in reality. Yet they say *bdre* de beun vino, a skin of good wine," *El de los bdrres*, "you with the skins."

SWEDEN.—Endar 20½ gallons ; kanna 100=67'60 gallons,

SWITZERLAND. Gerle 16 gallons.

UNITED STATES.—A wine gallon 231 cubic inches ; a barrel 31'5 gallons, Maryland barrel wine 326 lbs.

WINE MEASURES USED BY DIFFERENT NATIONS.

	Gallons.	Litres.		Gallons.	Litres.
<i>Ahm.</i>			<i>Carabus.</i>		
Hanover	41·095	155·552	Persia	7·500	27·877
Rotterdam	39·993	151·380	<i>Carga.</i>		
<i>Alma or metre.</i>			Barcelona	32·695	123·756
Constantinople ..	1·381	5·227	<i>Corba.</i>		
<i>Almude.</i>			Bologna	19·493	73·782
Oporto	6·731	25·480	<i>Cuba.</i>		
Faro	4·896	18·532	Abyssinia	0·268	1·016
Lisbon	4·370	16·541	<i>Cusa.</i>		
<i>Anker.</i>			Cyprus	2·633	9·967
Copenhagen	9·947	37·655	<i>Eimer.</i>		
Pernau	10·233	38·736	Breslau	14·670	55·532
Revel	11·172	42·276	Dresden	17·870	67·639
Riga	10·333	39·097	Erfurt	19·040	72·072
Rostock	9·562	36·199	Hungary, Higher	19·368	73·316
<i>Antheil.</i>			Hungary, Lower	15·030	56·892
Hungary	13·350	50·534	Leipsic	20·102	76·099
<i>Ansee.</i>			Munich	9·753	37·020
Lyon	21·809	82·549	<i>Eimer.</i>		
<i>Arroba.</i>			<i>Eimer, Visiermass</i>		
Canaries	4·245	16·073	Nuremberg	17·959	67·984
Spain	4·245	16·073	<i>Eimer, Schenkmass</i>		
Valencia	3·112	11·786	Nuremberg	16·761	63·439
Malaga	4·186	15·850	<i>Eimer.</i>		
<i>Barrique.</i>			Prague	16·950	64·167
Limoux	31·695	120·000	Prussia	18·145	68·690
Rhone	31·695	120·000	<i>Eimer, Great.</i>		
Basses Pyrenees	79·239	300·000	Ratisbon	30·014	113·620
Rouen	51·688	195·648	<i>Eimer.</i>		
Rochelle	46·039	174·279	Vienna	14·942	56·564
Nantes	63·405	240·000	Russia	3·250	12·249
Bordeaux	60·748	229·987	<i>Fuder or Stuckfash</i>		
<i>Barile.</i>			Germany	252·000	954·072
Corfu	18·000	68·133	<i>Gallon.</i>		
Naples	11·013	41·685	England	1·000	3·786
Florence	12·042	45·584	France	1·008	3·804
Bastia	36·986	140·000	Ireland	0·942	3·565
Genoa	19·610	74·225	<i>Garniec.</i>		
Leghorn	12·042	45·584	Poland	0·419	1·590
Ragusa	20·368	77·075	<i>Garra.</i>		
Rome	15·413	58·341	Minorca	3·187	12·063
Zante	17·625	66·707	<i>Hectolitre.</i>		
<i>Bareille.</i>			France	26·419	100·000
Rhone Depart'm't	63·390	240·000	<i>Kanns.</i>		
<i>Berg Eimer.</i>			Sweden	0·691	2·615
Ratisbon	23·196	87·812	<i>Leager.</i>		
<i>Both.</i>			India, Ceylon ..	150·000	606·080
Germany	126·000	477·037	<i>Lot.</i>		
<i>Botte.</i>			Dunkirk	0·608	2·302
France	112·519	426·000	Lisle	0·545	2·064
<i>Brenta.</i>			<i>Mass.</i>		
Milan	18·865	71·405	Augsberg	0·391	1·479
Verona	19·199	72·337	Shaffhausen	0·346	1·311
Bergamo	19·223	72·761	Berne	0·441	1·671
<i>Cantara.</i>					
Alicante	3·052	11·554			
Aragon	2·724	10·313			
Oviedo	5·098	19·286			

WINE MEASURES USED BY DIFFERENT NATIONS.

	Gallons.	Litres.		Gallons.	Litres.
<i>Maas.</i>			<i>Rubio.</i>		
Heidelberg.....	0·807	2·300	Turin	2·480	9·389
Mayence	0·493	1·868	Nice	2·076	7·857
<i>M. Land.</i>			<i>Salma.</i>		
Zurich	0·481	1·823	Messina	23·079	87·360
<i>M. City.</i>			<i>Secchio.</i>		
Zurich	0·433	1·642	Venice.....	2·853	10·800
<i>Madida.</i>			<i>Setier.</i>		
Brasil	0·700	2·651	Geneva	11·948	45·224
<i>Mastello.</i>			<i>Soma.</i>		
Ferrara	14·630	55·378	Ancona	22·698	85·917
<i>Millerolle.</i>			<i>Stoff.</i>		
Marseilles	16·990	64·330	Königsburg ...	0·378	1·433
<i>Moyo.</i>			<i>Stooprn.</i>		
Gallicia	42·798	161·991	Antwerp	0·728	2·748
<i>Ohm.</i>			<i>Stekan.</i>		
Basil	13·215	50·026	Amsterdam ...	5·126	19·408
Sweden	36·700	139·019	<i>Stubgen.</i>		
Dan'zic	39·572	149·756	Bremen	0·842	3·187
Strasbourg	12·176	46·093	Brunswick	0·969	3·669
<i>Orna.</i>			Stralsund	1·027	3·883
Trieste	14·942	56·564	Zell	1·025	3·883
<i>Ozchoft.</i>			<i>Vat.</i>		
Oldenburg	65·930	249·558	Netherlands ...	26·419	100·000
Libau	62·487	236·458	<i>Vedro.</i>		
<i>Pint.</i>			Russia.....	3·246	12·289
Scotland	0·447	1·694	<i>Viertal.</i>		
<i>Quartlin.</i>			Copenhagen ...	2·041	7·726
Cassel	2·160	8·175	Lubeo	1·913	7·241
<i>Quartant</i>			Osnaburg	1·290	4·883
Marne	23·789	90·057	Wismar	1·913	7·241
Burgundy	27·161	102·822	Frankfort	1·948	7·373
<i>Quart.</i>			Cologne	1·580	5·980
Lindau	0·606	2·294	<i>Velte.</i>		
La Nievre	30·375	115·000	France	2·017	7·609
<i>Quartin.</i>			Pordeaux	1·896	7·177
Majorca	7·168	27·131	Bayonne	1·952	7·390

1044. SPONGE. The sponge trade, which commenced in the Bahama Islands in 1841, quadrupled in value by 1866, when the exports amounted to about \$200,000. Although often far from the shore, and at a depth of twenty, forty, or even sixty feet, it can easily be descried through the transparent water on the clear sandy bottom, from which it is fished, raked, or grappled up. The sponge is the covering of the habitation of an order of animal nature, so low that organization can with difficulty be detected. When raised it is black, extremely offensive to the smell, and will almost cause the flesh it touches to blister. The first process is to bury it for twenty days, by which time the gelatinous animal matter seems to

be absorbed and destroyed, or is eaten by the insects that swarm in the sand. The sponge is then assorted and compressed in powerful presses, like cotton; each package has fastened to it outside a sample to show the fibre.

1045. **SQUINANTHEM.** 16 cwt. go to a ton at Bombay.

1046. **STARCH** should be stowed at a distance from all deliquescent salts, such as soda, potash, saltpetre, &c., and from all ammoniacal matters; see rice. All liquids placed near starch will be liable to leak.

1047. **STATIONERY**, in small bundles, should be conveyed by hand, and not suspended by the cord; bales are injured by being dropped suddenly on the ends or corners. The middle or upper part of the hold, or the 'tween deck, is preferred for stowage. Stationery must be kept dry and apart from ballast, and from liquids, especially turpentine, oil, &c., the scent of which alone diminishes the value of paper. One experienced London firm uses for America cases made of $\frac{3}{4}$ -inch hooped stuff with inch ends; for India the same, lined with tin, and for Australia with zinc; for the Overland route cases of $\frac{1}{2}$ -inch stuff, lined with waxed or tarred paper or gutta percha, as the whole must not weigh over 80 lbs.

1048. **Paper and Books.** 24 sheets 1 quire, 20 quires 1 ream, 2 reams 1 bundle, 4 pages 1 sheet folio, 8 pages 1 sheet, 16 pages 1 sheet octavo, 24 pages 1 sheet duodecimo, 36 pages 1 sheet eighteens.

**TABLE OF THE WEIGHT OF A SQUARE FOOT OF MILLBOARD
IN POUNDS AVOIRDUPOIS.**

Thickness in inches	$\frac{1}{8}$	3-16	$\frac{1}{4}$	5-16	$\frac{3}{8}$
Weight in Pounds...	·688	1·032	1·376	1·72	2·064

TABLE OF SIZES OF UNFRAMED SLATES.

Sizes.	Box.	Length.	Breadth.	Depth.
Inches.	doz.	ft. in.	ft. in.	ft. in.
6×4	60	2 6	1 3	0 10 $\frac{1}{2}$
7 5	48	2 4 $\frac{1}{2}$	1 5	1 0 $\frac{1}{2}$
8 6	40	2 1	1 7	1 3
9 6 $\frac{1}{2}$	40	2 1	1 9	1 3
10 7	20	2 1 $\frac{1}{2}$	1 4 $\frac{1}{2}$	1 0

Average weight, 3 cwt. each box.

TABLE OF SIZES OF WRITING SLATES.

PORT MADOC.					LIVERPOOL.						
Sizes.	Box	Length.	Breadth.	Depth.	Sizes.	Box.	Length	Breadth.	Depth.	Cube	
inches.	doz.	ft. in.	ft. in.	ft. in.	inches.	doz.	ft. in.	ft. in.	ft. in.	ft. in.	
6 × 4	30	3 5	1 5½	1 2	6 × 4	24	2 8	1 5	1 1	4 1	
7 5	24	2 10	1 7	1 3	7 5	20	2 3	1 9	1 3	4 8	
8 6	20	2 4½	1 9½	1 5½	8 6	20	2 3	1 10	1 5	5 10	
9 6	20	2 4½	1 11	1 5½	10 7	16	3 10	1 8	1 2	7 5	
10 7	18	4 2	1 8	1 1½	11 8	15	3 6	1 9	1 3	7 8	
11 7	15	3 7	1 8	1 2½	12 8	12	3 0	1 10	1 4	7 3	
12 8	12	2 13	1 10½	1 3½	13 9	12	3 0	2 1	1 6	9 5	
13 9	10	2 4½	2 1	1 5	14 10	10	2 6	2 3	1 6	8 5	
14 10		3 10	1 6	1 2							

Average 7 or 8 to a ton.

Average weight 2½ cwt.

1049. STAVES. Vessels of 500 tons may require 40 tons of ballast stowed fore and aft, on which a level surface is made with the staves over the floor; the layers are formed by placing the staves edgewise in the direction of the keelson, fore and aft, after which they are wedged in tight, with a *lignum vite* maul, and so continue until the vessel is full. The green and undried staves, being heavier, should be put below. Staves are mostly freighted as broken stowage, at a reduced rate; but as they are usually placed where few other goods would go, they are not unprofitable to the ship, although the freight is comparatively low; they are often injured by being stowed under tallow, which melts during the voyage.

1050. Quantities of staves split from rough oak, are sent to Great Britain from the Gulf of Venice. In the Morlacca Channel, a little to the southward of Fiume, is Segua, where in 1858 a master was offered staves 10 to 15 lines thick, 36 to 38 inches long, and 5 to 6 inches broad. Calculating that the average thickness would be 12½ lines taken at the middle, he accepted the charter-party. On delivery the consignee measured for freight at the thin end, and when an appeal was made to a Court of Law, this mode of measurement was confirmed as being "customary." The difference between the calculated and the real freight exceeded 50 p cent. The Admiralty instructions to masters of transports on returning staves are:— "When it is found necessary to shake the casks while on board, and you are consequently obliged to return them into store as staves, you must particularly observe that their several denominations are specified in the receipt you obtain for them, in order that you may thereby be enabled to ascertain their relative value in tonnage, cast

agreeably to the following scale, in doing which you are to carry the remains of one denomination to the next in succession, and if the remains of the last denomination be under twelve, no allowance can be claimed for them, but if twelve or above, then one half-hogshead is to be allowed, viz. :—

ADMIRALTY SCALE OF STAVES.

22 Leager staves .	1 Leager...	17 Barrel staves...	1 Barrel
20 Pipe ;.....	1 Pipe ...	17 Irish barrel ...	1 Irish barrel
20 Butt	1 Butt	17 Half-hogshead.	1 $\frac{1}{2}$ -hogshead
20 Puncheon	1 Puncheon	17 Small cask ...	1 Small cask
19 Hogshead	1 Hogshead	2 Single headings	1 Barl. stave

1051. **Trieste.** The barque *Messina*, loaded a full cargo of staves at Trieste, in 1866, left in September, and discharged them at **Hull**, in February, 1867. She registers 551 tons, is 141 feet long, 31.50 broad, and 17 feet deep. The cargo consisted of 237,000 staves, of which 20,000 were on deck ; the standard stave, by charter-party, was 27 inches long, 5 inches broad, and 22 lines thick, taken in the middle, all French measure. They were measured by a custom-house sworn officer, who came on the wharf at uncertain periods, say twice a day, and picked up 100 staves as they rose ; the measurement of these lots was taken as for all delivered that day. This measurement was satisfactory. The cost is about 50 florins for each standard—10,000. The staves shipped at Trieste are brought from the interior by rail ; they are of Italian oak, clean, and well planed. The crew put them into the hold, where they were received by two gangs of stevedores, four in each—one forward, the other aft. Two of each gang tended and two stowed. Excepting in the beam fillings and the ends of the ship, they were all on their edges fore and aft. The stevedores carried them up in bulks breast high, and wherever there was the least opening caused by a bent stave, &c., one was driven in until the bulks were perfectly tight. The hold was completely full. For loading and discharging 45 days were allowed. With this cargo she drew 15 feet forward and 15 $\frac{1}{2}$ feet aft, the same as with a cargo of Quebec timber, including a deck-load, and she grossed about the same freight. Timber 28s. $\frac{1}{2}$ load, staves 13s. 9d. $\frac{1}{2}$ 1,000 ; gratuity £10 10s. ; primage 10 $\frac{1}{2}$ cent. With 750 tons Cardiff steam coal, she drew forward 16 feet, aft 16 $\frac{1}{2}$ feet. At Trieste vessels generally load in the tier, when the merchants pay lighterage ; the *Messina* loaded in dock, she had 40 tons of stone ballast to keep her by the stern, otherwise ballast would not have been necessary.

the usual charge for stowing is 90 soldis p 1,000 staves. The expense of the crew for say two months at Trieste was about £113. The **port charges**, and everything included, were about £60, viz. :—

	florins.
Pilotage gratuities	22
Discharging ballast	100
Moving boat	90
Customs, harbour, and light dues	281 71
Stevedore's account	229 97
Public measurer	112

EXCHANGE.—Florins 128 75 for £10 sterling. 100 soldis are 1 florin Austrian.

The *Messina* was detained at Trieste owing to the war, and the Government pressing all the railway cars for conveyance of troops, stores, &c. About 20,000 p day is the usual day's work.

1052. **Staves—Trieste.** The brig *Phantom*, of Salcombe, Capt. W. MASTERS, 249 tons register; length, keel 108 feet, measurement 114; breadth 24 feet 2 inches, depth 14 feet 7 inches, loaded at Trieste, and left 29th September, 1868. Her cargo consisted of 133,388 oak staves, in 188,500 pieces, of the following dimensions, namely, 37 inches long, 5½ inches broad, and 12 lines thick, French measure. They were stowed in bulk, fore and aft, on their edges, as stated in "STEVENS ON STOWAGE." The brig had 25 tons of shingle ballast. When kindly supplying these details, Capt. MASTERS with much candour, says, if I had stuck to your rules I should have had my ship in much better trim. You say 40 to 50 tons of ballast for a ship of 500 tons; I had only 20 to 25 tons, when I ought to have had at least 40, as my deck-load was about 40 tons weight. By having ballast enough in the bottom to make a level for the ground tier of staves we should have taken just the same quantity, and the ship would have been much stiffer at sea; as it was she was very crank. With this cargo her draft was 13 feet 6 inches aft, and 11 feet forward. With a dead-weight cargo of 408 tons Cardiff coal, she drew 14 feet 10 inches aft, 12 feet 4 inches forward; her best trim at sea may be taken at 2 feet 6 inches by the stern. Her **port charges** at Trieste on the above cargo were £27, and at port of discharge, Grimsby, £16. Freight is paid for 133,388 staves, in 188,300 pieces, from 18 inches to 28 inches long. Staves are an expensive cargo, taking in and out, as the ship has to bear the cost of measuring at Trieste, as well as the stowage. This cargo measured 45 standard at 4 florins p standard, and £11 stowing, to £16 discharging. The deck load measured 12,000, the hold 121,000. Freight 7s. 6d. p hundred, equal to 5s. 6d. p quarter grain.

1053. Messrs. FERGUSON and GRAY, of South Shields, write to the *Shipping Gazette*, 4th July, 1868: "Our brig *Lawsons*, 244 tons register, was chartered through a London broker to proceed to Memel and there load a full and complete cargo of staves, for West Hartlepool, at £10 10s. $\frac{1}{2}$ mille of pipe staves, other dimensions in proportion as customary, according to Custom-house measure and certificate. She discharged—

		load.	feet.
25,541	Barrel staves, equal to	272	35
11,058	Heading ditto	78	43
60	Pipe ditto	—	46
60	Heading ditto	—	16
TOTAL.....		350	140

When the cargo was loaded at Memel, the master made complaint of his being supplied with so few pipe staves, but the shipper told him that he had only 14 mille on board, but they would turn out 17 mille at Hartlepool, and pay upon that; but upon coming to settle freight with the receivers of the cargo, they would only pay upon 13 $\frac{1}{2}$ mille, making a total freight of £144 15s. 11d., thereby depriving us, as we consider of about £38, as according to the London and Baltic printed rules the mille of Baltic staves of 1,200 pieces is equal to 20 loads of fir timber; and according to this rate, the vessel had on board and delivered 17 $\frac{1}{2}$ mille of staves. We have written the receivers of the injustice of this settlement, but their reply is that they will pay no more, and if we are not satisfied, we can go to law. Your opinion upon this matter will oblige. The editor answers: "The ship was entitled to freight on a full and complete cargo, *i.e.* at £10 10s. $\frac{1}{2}$ mille of pipe staves. She was not wholly laden with pipe, therefore other staves would have to be taken in proportion. The mille of running pipe is equal to 20 loads of fir timber. The Baltic mille standard of 1,200 pieces, is equal in measurement to 16 $\frac{1}{2}$ loads of timber."

1054. **Damaged.** In the Liverpool County Court, 8th May, 1858, M'MURDO v. STEPHENSON. This action was brought to recover £13 17s. JAMES HALSALL, managing clerk to plaintiff, stated that the staves were irretrievably damaged by lard, in the ship *Thalatta*, from New Orleans. The grease penetrated to the heart of the wood, and could not be removed in the process of dressing. The charge for freight was £6 $\frac{1}{2}$ thousand, that being as high a rate as had been ever paid by plaintiff, and much more than was customary for staves when brought as dunnage, which they frequently are in cotton-laden ships. Mr. DRYSDALE, stave merchant, had examined them soon after arrival; they were injured by grease, and he estimated the injury at £13 17s., that is £3 per 1,000 for the hogshead staves, and 10s. per 1,000 for the small. Mr. STATHAN contended that staves were always brought as dunnage, and were therefore taken at a lower rate than

otherwise. The cargo of the *Thalatta* was a general one, and the parties who shipped the staves saw how they were stowed and made no objections. Mr. HIME argued that such a defence was not open to defendant. His Honour, Mr. BLAIR, did not quite concur in that view, and allowed evidence to be heard. Defendant deposed that the staves in question were double staves, and unless brought as dunnage would have been charged £12, instead of £6 per 1,000. Staves are frequently brought with lard. Capt. WILSON, of the *Mountaineer*, had just brought a quantity as dunnage, with cotton and corn from New Orleans. He received £5 per 1,000, but if they had come as cargo he should have required double that rate. His Honour said he did not think much of the fact of their being brought as dunnage; the staves were shipped upon a general bill of lading, and if placed with a commodity peculiarly likely to injure them, the master was liable. It would have been easy to have guarded against that by having a clause to that effect inserted in the margin of the bill of lading. Judgment for plaintiff.

Proportionate Tonnage. The following quantities of staves severally weigh 15½ tons, and occupy a space of 850 cubic feet or 1 keel.

Quantity.	Description.	Number.	Long.	Thick.
mille.		pieces.	inches.	inches.
1'275	Baltic Reduced	1,200	66	1½
1'300	Odessa reduced			
1'200	Quebec reduced			
0'840	Baltic staves, rough ...	1,200	72	3½
0'708	Odessa rough	1,200	76	3½
1'054	Quebec rough	1,200	66	2½
3'885	West India	1,200	42	1½

The staves to average 6 inches in breadth.

One hundred staves contain 120 pieces; 1 mille is 10 hundred, or 1,200 pieces.

Baltic, as cargo: 1 mille running pipe equal to 20 loads of fir timber, 1 mille standard, 1,200 pieces, equal in measurement to 16½ loads timber. 1 mille West India, 1,200 pieces, equal in measurement to 5½ loads timber.

Dantzic pipe are of three different sorts, crown, brack, and bracks brack. The usual size of crown pipe staves: not exceeding 72 inches in length, 7 in width, and 3 in thickness. Brandy staves: at least 54 to 58 inches long, as thick and broad as pipe staves. Hogshead: 42 to 45 inches long, breadth and thickness as pipe staves; all English measure. The quality is ascertained by the following marks to distinguish each sort:

Crown pipe staves stamped at the end K	Brack in middle I	Bracks Brack I.I
Hogshead crown at the end O.K	Brack in middle I	Bracks Brack I.I
Brandy hogshead crown at the end B.K	Brack in middle X	Bracks Brack X.X

When pipe staves are taken for broken stowage at **Dantzic**, freight is paid per mille, that is 1,200. For broken stowage from **Memel** and **Dantzic** staves usually receive half freight. **Christiana**, for hogsheads occupy much space, therefore more than ten ought not to be counted to a deal. **Stettin**: one mille pipe staves, 1,200, is equal to 1,800 hogsheads, 2,400 barrels, 3,600 hogshead headings, or 4,800 barrel headings.

In some parts of the continent staves are reckoned by the shock; thus, a long thousand usually consists of 20 shocks, each of 60 pipe staves; hogsheds 30 shocks, barrels 40; *Headings*, pipe 40 shocks, hoghead 60, barrel 80.

Quebec pipe staves are from 64 to 68 inches long, 5 to $6\frac{1}{2}$ broad, and $1\frac{1}{2}$ to 3 inches thick. 1-inch pipe staves are one-third less than the standard; every $\frac{1}{2}$ -inch above $1\frac{1}{2}$ is charged one-fifth more, without allowance for breadth.

Size.	Description.	Length.	Equal to.
inches.		inches.	
$1\frac{1}{2}$	Staves, pipe	66	Standard pipe staves
$1\frac{1}{2}$	— hoghead ...	54	Two-thirds of ditto
$1\frac{1}{2}$	— barrel	42	Half of ditto
$1\frac{1}{2}$	— heading ...	30	Two-fifths of ditto

1 mille or 1,200 standard Quebec staves=343 feet 9 inches, or $6\frac{1}{2}$ loads.

175 ditto 50 feet 1 inch and $6\frac{1}{2}$ parts.
or 1 load 1 inch and $6\frac{1}{2}$ parts.

PIPE STAVES FOR FREIGHT AT QUEBEC, 1832.

ft. in.		pieces.	
$5\frac{1}{2} \times 1$	Two-thirds standard	1,800	1 standard
$5\frac{1}{2} \times 1\frac{1}{2}$	The standard	1,200	—
$5\frac{1}{2} \times 2$	Add one-fifth	1,000	—
$5\frac{1}{2} \times 2\frac{1}{2}$	— two-fifths	860	—
$5\frac{1}{2} \times 3$	— three-fifths ...	750	—

One bundle of oak laths, 120 pieces, 4 feet long, $37\frac{1}{2}$ equal to 8 tons.

Ditto 5 — 30 ditto.

STAVES, CALCULATION OF, AT QUEBEC, 1832.

Hogshead Staves.		Barrel Staves.	
ft. in.		ft. in.	
$4\frac{1}{2} \times 1$	Half standard	$3\frac{1}{2} \times 1$	One-fourth
$4\frac{1}{2} \times 1\frac{1}{2}$	Seven-tenths	$3\frac{1}{2} \times 1\frac{1}{2}$	Half-standard
$4\frac{1}{2} \times 2$	Deduct one-fifth	$3\frac{1}{2} \times 2$	Six-tenths ditto
$4\frac{1}{2} \times 2\frac{1}{2}$	— one-tenth	$3\frac{1}{2} \times 2\frac{1}{2}$	Seven-tenths
$4\frac{1}{2} \times 3$	The standard	$3\frac{1}{2} \times 3$	Eight-tenths

Under the article Timber will be found several comparative results applicable to staves.

1055. STEAM AS AN EXTINGUISHER. ROBERT WISE, steam-ship agent, at King's Lynn, says, in a letter dated September, 1869, and addressed to the Board of Trade: "I have had practical experience of the effect of steam at a nominal pressure, on board a wood steam boat which was set on fire by the coal in the bunkers igniting some hours after the vessel had been moored. The vessel was internally

all in a blaze, to such an extent that the pure flame glared from the top of the funnel to the height of from six to nine feet. Persons from the shore were clearing the decks and had given the vessel up for lost. On board this vessel there was a man-hole hatch directly over the boiler. This hatch was removed and water was thrown on the boiler (it being very hot from the flames passing through the furnaces.) The water was converted into steam, which penetrated every part of the interior, and had instant effect on the fire, and the vessel was saved. There is no doubt that steam at a moderate or high pressure, generated within a boiler, would be still more penetrating and effectual. If, therefore, every steam-ship were provided with a pipe attached to the steam chest, and conducted by the sides of the ship to each compartment, with a cock or valve, so that in case of fire the cock belonging to any compartment could be opened to allow the steam to enter (the hatches being battened down and the bilge taps closed to prevent escape,) the steam would very soon overcome the fire and completely extinguish it."

1056. STEAM ENGINES. It is estimated that marine engines with boilers full of water, average from 15 to 18 cwt. per nominal horse-power. The effective horse-power of some of the best-made compound engines, is about five times greater than the nominal horse-power, thus the 350 horse-power nominal of the steamer *Atrato*, worked up to and indicated 1,575 horse-power.

1057. STEEL. Bar steel is sent from Sheffield in bundles of about one cwt. each, and may be stowed as bar iron. Tilted cast steel and shear steel for exportation, are packed in extra strong cases of about five cwt. each, iron bound. The air arising from salt-water will always create a certain amount of rust on steel, iron, &c., and no master should be considered liable for injury by rust, unless it can be clearly proved to having arisen through negligence on his part. **Sheffield cutlery** for exportation is sometimes packed in a prepared paper which is stowed twelve months before being used, and is then placed in a room warmed by a stove that every particle of dampness should be removed. For Australia, cutlery is packed in air-tight casks, lined with tin. A faggot of steel weighs 120 lbs.

1058. STEERING.—Rule of the road. Being aids to memory, in four verses. By THOMAS GRAY. (Inserted by kind authority.)

1. *Two Steam-ships meeting.*

When both side lights you see ahead—
Port your helm, and show your RED.

2. *Two Steam-ships passing.*

GREEN to GREEN—or, RED to RED—
Perfect safety—Go ahead !

3. *Two Steam-ships crossing.*

Note.—This is the position of greatest danger: there is nothing for it but good look-out, caution, and judgment.

If to your starboard RED appear,
It is your duty to keep clear ;
To act as judgment says is proper :—
To Port—or Starboard—Back—or, Stop her !
But when upon your Port is seen
A Steamer's Starboard light of GREEN,
There's not so much for you to do,
For GREEN to Port keeps clear of you.

4. *All Ships must keep a good look-out, and Steamships must stop, and go astern, if necessary.*

Both in safety and in doubt,
Always keep a good look-out ;
In danger, with no room to turn,
Ease her !—Stop her !—Go astern !

14th OCTOBER, 1867.

The above verses are mere aids to memory, and must in no case supersede a careful study of the authentic regulations.

1059. Regulations under Merchant Shipping Act, 1862, for preventing collisions at sea.

1. In the following rules, every steam-ship which is under sail and not under steam is to be considered a sailing ship, and every steam-ship which is under steam shall be considered as under steam.

2. RULES CONCERNING LIGHTS.—The lights mentioned in the following articles numbered 3, 4, 5, 6, 7, 8, and 9, and no other, shall be carried in all weathers, from sunset to sun rise.

3. Sea-going ships when under weigh shall carry—

(a.) *At foremast head* a bright white light, so fixed as to show an uniform and unbroken light over an arc of the horizon of twenty points of the compass, that is ten points on each side of the ship, viz., from right ahead to two points abaft the beam on either side, and to be visible on a dark night, with clear atmosphere, at least five miles.

(b.) On the starboard side a green light, to throw an unbroken light over an arc of the horizon of ten points of the compass, that is from right ahead to two points abaft the starboard beam, and to be visible on a dark night, with a clear atmosphere, at least two miles.

(c.) On the port side a red light, to show an unbroken light from right ahead to two points abaft the port beam, visible on a dark night, with a clear atmosphere, two miles.

(d.) The said green and red lights shall be fitted with inboard screens, projecting at least three feet forward from the light, so as to prevent these lights being seen across the bows.

4. Steamers when towing other ships shall carry two bright white mast-head lights vertically, in addition to their side lights; each of these mast-head lights to be of the same kind as those used by other steamers.

5. Sailing vessels in tow to carry same lights as steam-ships, with the exception of the mast-head light, which they shall never carry.

6. Whenever, as in the case of small vessels during bad weather, the green and red lights cannot be fixed, they shall be kept on their respective sides of the vessel, ready for instant use; and on approach of other vessels shall be exhibited in sufficient time to prevent a collision, and in such manner as to make them most visible, and so that green shall not be seen to port or red seen to starboard. The green lantern shall be painted green and the red lantern painted red, and shall have suitable screens.

7. Steam and sailing vessels at anchor in roadsteads or fairways shall exhibit where best seen, at a height not exceeding twenty feet above the hull, a white light in a globular lantern, eight inches in diameter, to show a clear unbroken light, visible all around the horizon at a distance of at least one mile.

8. Sailing pilot vessels shall not carry the lights required by other vessels, but shall carry a white light at the mast head, visible all round the horizon, and shall exhibit a flare-up light every fifteen minutes.

9. Open fishing and other boats are not required to carry side lights; they may use a lantern having a green and red slide; such lantern shall be exhibited in sufficient time, as in No. 6. Fishing vessels and open boats when at anchor are attached to their nets and stationary, shall exhibit a bright light, and a flare-up if considered by them requisite.

10. RULES CONCERNING FOG SIGNALS.—Whenever there is a fog (by day or night), the fog signals, hereinafter described, shall be used at least every five minutes.

(a.) Steam-ships under weigh shall use steam whistle placed before the funnel not less than eight feet from the deck.

(b.) Sailing ships under weigh shall use a fog horn.

(c.) Steam and sailing vessels not under weigh shall use a bell.

11. If two sailing vessels are meeting end on or nearly so, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on port side of the other.

12. When two sailing vessels are crossing so as to involve risk of collision, then if they have the wind on different sides, the ship with wind on port side shall keep out of the way of other ship with wind on starboard side; excepting if ship with wind on port side is close hauled and the other ship free, then the latter shall give way; but if they have the wind on same side, or if one has wind aft, the one to windward shall keep out of the way of the ship to leeward.

13. If two steamers are meeting end on or nearly so, as to involve risk of collision, then the helms of both shall be put to port, so that each may pass on the port side of the other.

14. If two steamers are crossing so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

15. If two ships, one of which is a sailing vessel and the other a steamer, are likely to come into collision, the steamer shall keep out of the way of the sailing vessel.

16. Every steam-ship when approaching another ship so as to involve risk of collision, shall slacken speed, or, if requisite, stop and reverse; and every steam vessel in a fog is to go at a moderate speed.

17. Every vessel overtaking any other vessel shall keep out of her way.

18. When one vessel has to keep out of the way of another, the other shall keep her course, subject to the following rule.

19. Nothing in these rules shall exonerate any shipowner, or master, or crew from the consequences of any neglect to carry lights or signals, or of the neglect to keep a proper look-out, or of the precautions which may be required by the ordinary practice of seamen and by the special circumstances of the case.

These rules have been adopted by—Austria, Argentine Republic, Belgium, Brazils, Chili, Denmark, Equador, France, Greece, Germany, Hawaiian Islands, Hayti, Italy, Morocco, Netherlands, Norway, Peru, Portugal, Russia, Spain, Sweden, Turkey, United States, and Uruguay.

NOTE.—Many steamers carry the mast-head lights on the foretop-mast stay. It has, however, been held in the Admiralty Court that this is a breach of article 3. It was decided in the Admiralty Court,

18th June, 1873, that barges in a river (if in the fairway) are bound to exhibit a light.

1060. **STEVEDORE.** The stevedore is the person who superintends the loading or unloading of the ship. The word comes from the Spanish "estobar" to stuff or pack, whence "estidator," packer, and thence stevedore. Subject to any special directions from the owner, or the ship's husband, the person to receive the goods and stow them is within the captain's order and direction, the chief mate being generally the officer to whom the office is deputed. 2nd.—When there is no agreement, or no custom of the trade of the port to the contrary, the charge of stowing, as a general rule, falls on the ship. 3rd.—The employment of a stevedore is under no circumstances compulsory. 4th.—A stevedore, like any other man, is under the implied condition, in law, that he will do properly what he undertakes to do for a consideration ; and he is liable for any loss accruing to his employers through carelessness on his part in the performance of his duties.

1061. It is the practice with some masters to rest entirely on the integrity of the stevedore for the stowage of cargo, but this confidence may be misplaced. At times the interest of the stevedore is directly opposed to that of the shipowner. When the stowage is paid for by a round sum, endeavours are made to fill as fast as possible by what is technically termed "blowing the ship up ;" on re-stowage it has been found that the hold was capable of taking many additional tons of goods. The reverse of this also occurs. Cargoes of iron have shifted after stowage by stevedores ; and many iron-laden ships founder. After two or three voyages to the Brazils, some seamen and apprentices can stow hides, &c., better than the most orthodox stevedores there. As facts of this kind can be readily multiplied, masters and mates will do well in all cases to judge for themselves, and remembering the liability to the underwriters, see to the stowage, even where stevedores are regularly employed. Every master should send an officer, the second mate usually, into the hold while the stevedores are there ; he can see that proper dunnage is used, prevent pillage, and knowing where the various goods are placed, save much trouble and confusion when discharging. When stevedores are employed by the shipper, and not engaged with the concurrence of the master, the owner is not liable for their charge, unless stipulated for in charter-party. Should the stevedore be appointed by charterer or his agent, and the cargo become damaged through bad stowage, the holder of a clean bill of lading will have claim against the ship for such bad stowage ; see paragraph 1039.

1062. **Cotton.** In 1861, the ship *Stebonheath*, was laden with cotton by stevedore at Mobile. She registers 921 tons, keel 154 feet, depth 23, breadth 34; 'tween decks $6\frac{1}{2}$ feet. Her cargo consisted of 2,809 bales, averaging 520 lbs. each; of these 105 were stowed in the cabin and nine on deck, under the break of the poop. The *Stebonheath* is rather sharp in the ends; she had in 100 tons stone ballast, which was used for dunnage. Under the main hatch it was only five inches deep—it should have been ten inches. The principal part of the ballast was placed in the ends. The object of the stevedore in decreasing the ballast amidships, was to get more heights of bales there, he being paid cents \pounds bale for all put into the ship. The chain-locker was, for the same reason, removed from the hold, and the chains were brought on deck. In the poop the bales were screwed so tightly that the partners of the mizen-mast were lifted five inches. All this was done while the master was at Mobile watching the proper pressing of the bales, the ship being in Mobile Bay, 25 miles down, in the hands of the stevedore. She was crank, and sometimes "very tender," with an ordinary cargo; laden in this manner she was still more so. The ballast ought to have been amidships; the chain-cables should have been in their ordinary place, chiefly in the bottom—the locker going right down to the keelson, and no cargo should have gone in the poop. The *Stebonheath* sailed Saturday, 13th April, and on Monday following met a "norther," (a strong gale from the north,) which lasted about two hours. Although under close-reefed topsail, foresail, and fore-topmast stay-sail, she was hove on her beam ends on the port side. The ship arrived at Liverpool about the 20th May. Many bales on the ground tier, and a few in the second tier on the port side (101 in all), were wet with leakage, which cost the ship $\pounds 1 \pounds$ bale— $\pounds 101$.

1063. **Density of the Sea.** Mr. IRVING, *Marinus*, says: "When loading at Glasgow, I found she was likely to be deep, and I marked her so that she would have a clear side of three inches per foot of hold, and informed my agent there that I would prevent shipper (charterer) from putting any more cargo in when she got down to the mark. He informed me I could only claim that clear side on leaving the tail of the bank, (Clyde, off Greenock). He said the case had been tried at Glasgow, and decided against the ship. A first-class stevedore informed me that he was stowing an American ship at Glasgow—the ship being chartered at a lump sum. When she was down to her marks, the master stopped him from putting any more cargo on board, and left Glasgow for the tail of the bank. Some goods being left on the quay, the stevedore was instructed by

the shipper (he being engaged as usual by shipper, but paid by ship) to go down to the ship and take a witness with him, and measure her side, and on his arrival, the master being on board, he measured her in his presence and found she had risen some four or five inches. The shipper then compelled the master to take the other goods and pay the lighterage expenses."

1064. **Deficient Dunnage.** At Liverpool, 8th January, 1857, JOSEPH GORMAN, stevedore, sued P. TAYLOR, owner of *Summer Cloud*, for 1s. per ton for stowage, he having been discharged for delay after commencing the work. GORMAN proved that the delay was caused through want of dunnage, and the jury awarded him £6 damages.

1065. **Bad Stowage.** A correspondent writes to the *Gazette*, 27th December, 1861 :—"A few months since I chartered a ship to take general cargo to Auckland for a lump sum; charterers reserved power to appoint the stevedore, but to be paid by the ship, and be under the master's control. On discharging at Auckland the cargo is found to be damaged and the ship is made to pay for it. The master had a survey which he sends home, and which states, 'I have never attended the discharge of a vessel more carelessly stowed, and the goodness of packages is the only reason that has prevented heavy claims.' On receiving this we applied to the stevedore to reimburse us what we had to pay on account of his carelessness, and on his refusing we offered to submit to the arbitration of the charterers as to whether he ought to pay us the whole or any part. That offer being also declined we ask the favour of your informing us whether you consider we have a legal claim or not?" The Editor says—"If it can be shown that the bad stowage was of such a character that the 'control of the master' could not reasonably be expected to have prevented, the stevedore ought to pay for his carelessness. The arbitration of the charterers would not be quite impartial, but two or three competent persons should be appointed who would see the documents, hear the parties concerned, and determine the liability."

1066. **Responsibility.** Queen's Bench. ROBERTS v. SHAW. (Before Mr. Justice MELLOR and a special jury.) 7th July, 1862. Plaintiff is a shipowner, of Milford; defendants, Messrs. SHAW, SAVILLE, and Co., are ship brokers. The action was brought to recover £75, the expense incurred in unloading and re-shipping cargo by reason of the improper stowage. Defendants denied the negligence, and pleaded that the cargo was stowed by the plaintiff's agents. Plaintiff's case was that in the autumn of 1853, the *Robertson* was chartered to take a general cargo from London to San Francisco and Victoria, the charter-party providing that she was to be loaded by a stevedore recommended by charterer, at the owner's expense. On arrival at San Francisco it was found that the portion of cargo consigned there was so stowed amongst that intended for Victoria, that the whole had to be discharged, and that consigned to Victoria to be re-shipped, the cost £75, had been deducted from the freight, and which the plaintiff had to pay under protest. It was alleged that the cargo was stowed by the stevedore, the charterer's agent, as specified in the charter-party: that when a ship was consigned to a double port, one half of the ship should be devoted to the goods for the first port, and the other to the second or final port; and that when the ship had discharged at the first place of call, the cargo could be equalised over the hold. It appeared that a quantity of coal was consigned for and discharged at San Francisco. The master stated that he remonstrated with the stevedore;

that he went to the defendant's office and saw Mr. FITZ, their clerk, and complained of the mode of loading, and that the stevedore made some difference in the stowage. It was contended that, had proper care been adopted in stowing the expense would have been avoided, and that the stevedore was clearly the agent of defendants. Mr. WILLIAMS, for defendants, submitted that when a ship was consigned to a double port, there was a difficulty in stowing a cargo so as to avoid an unloading and re-shipment; that, in this case, the difficulty was increased in consequence of the brands and marks not sufficiently indicating for which port they were intended; but that they were marked in the usual way; and that although the stevedore was nominated by the charterer, he acted under the direction of the master, and was paid by the ship, and the plaintiff had control. BARRETT, the stevedore, said he frequently consulted the master, and he considered himself his servant. He was nominated by the charterer, but paid by the owner; that was the custom. Mr. SHAW, one of the defendants, and several shipowners, were called to prove that, when a ship was loaded for a double port, it was almost impossible to load her with due regard to safety, so as to avoid her being unloaded at the first port of call, and to re-stow the cargo. It was stated that among the cargo of the *Robertson* there was some soda, and that had due care not been taken in stowing it against the side of the ship, the other portion might have been damaged by it. One witness (Mr. WAY), however, thought it practicable to load a cargo for a double port, so as to avoid the re-stowing. Mr. FOTHERINGHAM said it was impracticable, with a due regard to safety, to avoid re-stowing. Mr. KARSLAKE replied, and in urging the point that the stevedore was really the agent of the charterer, quoted the case of "*BLACKIE v. STEMBRIDGE*," argued in the Court of Common Pleas and in the Exchequer Chamber. Mr. WILLIAMS said there was this distinction between that case and the present one, that the goods were in course of shipment, and were really not on board. Mr. Justice MELLOR summed up. Although the stevedore, who was recommended by the charterer, was paid by the ship, yet it would not follow that he was the servant of the plaintiff. The master had the right to look so much after the loading as affected the safety of the ship, and the jury would say whether he went beyond that, and so far interfered in the stowage as to render him liable for what followed. The stevedore was appointed by the charterer, but it would be unreasonable to deny the master the right of seeing that his ship was not so loaded as to render her unsafe. Then, had he exceeded that limit, and exercised a control over the stevedore? If they should be of opinion that the stevedore continued the loading without any authority or control on the part of the master, he was of opinion that the expense of unloading and re-shipping should fall on the charterers, and that the amount should not have been deducted. He would, therefore, ask them whether the master so interfered as to control the conduct of the stevedore? Mr. WILLIAMS suggested that another point should be left to the jury, as to whether it was practicable to load a ship for a double port, having regard to the ship and the nature of the cargo, so as to avoid the expense of unloading and re-shipping. His lordship said, no doubt that was a material question for the jury to determine, and he would leave it to them to decide. The jury at once, in answer to the first question, found that the stevedore loaded the ship under his own will, and was not controlled by the master; after retiring and being some time in deliberation, found, in answer to the second point, that it was practicable to load a ship for a double port without having the whole cargo unloaded, but that it would be necessary to unload and re-stow a portion of it. Verdict for plaintiff.

1067. **Improper Stowage.** Court of Common Pleas. *SACK v. FORD*. 25th November, 1862. This was a rule to show cause why the verdict should not be set aside. The action, which was tried at the Guildhall Sittings after the previous Trinity Term, was brought to recover compensation for damage caused to a quantity of oats shipped at Stettin for London, in defendant's steamer *Imperial*. It appeared that upon the oats stowed in the hold was placed a quantity of spelter, which pressed the grain down, causing it to be heated, and discoloured, and otherwise deteriorated. The verdict went for plaintiff, leave being given to move the Court to enter the verdict for defendant upon the construction of the charter-party. Mr. Sergeant *SHEE*, in the early part of the term, obtained a rule *nisi*, and the case now came on for argument. In the charter-party were two clauses to the following effect:—the cargoes are to be taken on board and discharged by the charterers, the crew of the vessel rendering customary assistance, so far as they may be under the orders of the master, and the charterers are to have liberty to employ stevedores and labourers to assist in the loading and discharge thereof, they being under the control and direction of the master, the charterers are not in any case to be responsible for damage or improper stowage. The master and the owners of the said ship shall devote the same attention to the cargo, shall use the same endeavours to promote dispatch, and shall in every respect be and remain responsible to all whom it may concern, as if the said ship were loading and discharging her cargoes, and performing her voyages, for account of the said owner, and independently of this charter-party. On the part of defendant it was contended that as the charterers employed the stevedores and labourers to assist in the stowage, and that the clause specified that the cargoes were to be taken on board and discharged by the plaintiff as charterer, the owner could not be liable for the damage which had arisen in this instance. The case of "*BLACKIE v. STEMBRIDGE*," argued in the Exchequer Chamber was cited in support of defendant's case. The Court ruled that the true meaning of the clauses in the charter-party was, that the stevedores and others employed in stowing the cargo, although employed by the charterers, were really under the control of the master. The verdict, therefore, would stand.

1068. **Cotton Cargo.** At the Liverpool Court of Passage, 1st November, 1864, before Mr. JAMES, Q.C. Mr. CHALLINOR, a master stevedore, brought an action against WILLIAMS, the "husband" and part owner of the *Montesuma*, for £38 due to him under a contract for the discharge of that vessel. She was laden with cotton, and defendant accepted the offer of plaintiff to discharge the cargo for £18 10s. Plaintiff, however, discovered afterwards that the lower tiers were in a worse state than the upper tiers, and that the labour would cost more than he expected. He accordingly went to defendant to try to make more suitable terms, and the point was whether plaintiff made another agreement. The evidence was very contradictory. Defendant himself stated that he insisted on the performance of the original contract, only excepting that he offered to pay for the additional assistance of three men, in respect to which assistance he had paid a guinea into court. Plaintiff swore that on discovering the condition of the cotton he complained to defendant, who gave him authority to engage extra hands, in consequence of which he incurred the amount claimed. Verdict for defendant.

1069. **Cotton Fired.** The following is extracted from the Report of Mr. RAFFLES, police magistrate, Liverpool, to the Committee of Privy Council for Trade, 29th August, 1865. The screw steam-ship *Glasgow*, 1,153 tons, belonging to Mr. WILLIAM INMAN, left New York at 4 a.m. 30th July, 1865, for Liverpool,

under command of Mr. HENRY MANNING. She had a crew of 69, 27 cabin and 198 steerage passengers, and a general cargo, consisting of cotton, grain, leather, &c. The holds being full, a portion of the cotton was carried in the fore steerage and berths, extending from the fore-castle bulkhead to three feet abaft the main hatchway. When stowing sufficient care had not been taken by the stevedore to keep the bales clear of the sounding-well of the fire compartment, which was on the starboard side and only accessible from the main deck, and instead of leaving the vacancy there he had left it on the port side, and unfortunately the ship's officers did not discover the mistake. Soon after leaving the carpenter ascertained that the foremast sounding-well was thus covered up, and he reported it to the chief officer. On the following day the carpenter, on sounding the main well, found more water than usual, and became the more anxious to sound the fore compartment, and on again reporting it, the chief officer promised that he would send the watch in the course of the day to clear away the cotton, so that he might get at the well. About 1-30 p.m., the carpenter went below with WHITEHEAD, the boatswain's mate, to point out to him what he required to be done, and they took with them a bull's-eye lantern fastened by a sliding pin. The cotton extended to about 20 feet abaft the sounding-well, and a passage had been left over it to admit of one man crawling in at a time. The carpenter preceded WHITEHEAD, who carried the lantern. On reaching the sounding-well the carpenter got down into it, and called to WHITEHEAD to hand him the lantern. In raising himself he caught the lantern with his head or shoulder, and knocked it out of WHITEHEAD's hand. It burst open, and the lamp fell among the cotton, which immediately ignited, the fire spreading rapidly. Both men endeavoured to extinguish it, but were compelled shortly to scramble out, not before the carpenter had been considerably burnt in the face and hands. The *Glasgow* was destroyed; her crew and passengers were rescued by the American barque *Rosamona*, Capt. WALLACE.

RATES OF A FIRST-CLASS LICENSED STEVEDORE IN 1864.

For loading a ship under 600 tons at the quay, GLASGOW; if second off 1d. $\frac{1}{2}$ ton extra.

	s. d.		s. d.
Measurement goods	$\frac{1}{2}$ ton	Hogsheads coal, lime, and tinware	0 9
Bundles wood housing (meas.) ..	1 6	Puncheons and pipes spirits	1 3
Machinery, anchors and cables,		Puncheons and tierces dry goods ..	0 7
with crane	2 6	Tierces paints and chemicals	1 2
Pots, stoves, and grates	3 0	Tierces bottled ales	0 3 $\frac{1}{2}$
Pipes, plates, galvanized iron, &c.	1 9	Barrels tar and cement	0 4
Railway iron, chairs, sleepers, &c.	1 2	Quarter-cask spirits, &c.	0 5
Bar-iron	1 0	Barrels ale, flour, &c.	0 2
Pig-iron, lowered and stowed	0 9 $\frac{1}{2}$	Kegs, jars, shooks, hoops, oil cans,	
Cordage	1 2	&c.	0 1 $\frac{1}{2}$
Coals, wheeled and trimmed	0 9 $\frac{1}{2}$	Ploughs	1 3
Coals, lowered and trimmed	1 6	Cases of spirits, &c.	0 1
Coke, lowered and trimmed, or with		Hogsheads brandy, &c.	0 7
baskets	2 0	Bags salt, guano, &c.	0 2 $\frac{1}{2}$
Flag stones	2 8	Bags oats and flour	0 2 $\frac{1}{2}$
Large pipes over a ton	2 0	Horses and cattle	7 6
Sugar pans, as agreed		Punts, iron	6s. to 7 6
Copper, lead, tin, soda, paints,		Crates and mats bottles	0 4
clay, and putty	$\frac{1}{2}$ cwt. 0 1	Flooring boards	0 0 $\frac{1}{2}$
Bricks, slates, and tiles $\frac{1}{2}$ 1,000 ...	4 6	Planks and battens	0 2
Boilers, from 1 to 3 tons	20 0	Pipe boxes, soap boxes	0 1
Boilers, from 3 to 5 tons	50 0	Hogsheads sugar	1 0
Grindstones, as agreed		Chimney cans and oven soles ...	0 2
Hogsheads ale	each 0 7	Retorts	2 6

Work done after 6 p.m. 2d. $\frac{1}{2}$ hour each man will be charged in addition to the regular rate.

1070. **Stevedore.** Liverpool Assizes, December, 1867, before Mr. Justice SHEE. Messrs. SPAIN and M'CABE, stevedores, brought action against ROME and another, owners *Belpore*, for loading her at 1s. 6d. $\frac{1}{2}$ ton. She burthened 1,199 tons, and was bound to Calcutta. Cargo, iron, 1,608 tons dead-weight. When loading a ship, the stevedore was given a general account of the whole cargo, in order that he might make his calculations. The *Belpore* was first of all in the Stanley dock, discharging rice; before removal, 160 tons railway iron were put in the hold to stiffen her for removal to London dock. When there, the master, who was described as being a timid man, interfered, and insisted on having cargo put in according to his instructions. The stevedores complained to the owners, who told them to please the master. She was loaded down to her mean draught of 19 $\frac{1}{2}$ feet, went to sea, and was brought back to Liverpool, where part of the cargo had to be re-stowed, involving an expense of £280. Verdict for stevedores.

NEW YORK.

List of Prices adopted at a stated Meeting of the Master Stevedores, held 28th of March, 1867.

<i>Discharging.</i>		<i>Discharging.</i>	
	£ c.		£ c.
Coffee, $\frac{1}{2}$ bag	0 3	Hides, $\frac{1}{2}$ 1,000	12 0
Tea, $\frac{1}{2}$ ton	0 30	Saltpetre, $\frac{1}{2}$ ton	0 50
Sugar, $\frac{1}{2}$ hogshead .....30 to	0 34	Nickel muc	0 50
-- $\frac{1}{2}$ box...10 to 11 $\frac{1}{2}$ bag	0 5	Guano	0 50
Light goods, $\frac{1}{2}$ ton	0 30	Pig iron	0 50
Heavy goods, $\frac{1}{2}$ ton	0 44	Brimstone	0 50
General Liverpool cargo, $\frac{1}{2}$ ton	0 50	Fruit, $\frac{1}{2}$ box	0 2
Sugar in hogsheads	0 25	Rags, $\frac{1}{2}$ bale ..	0 25
Molasses in hogsheads	0 30	Malaga fruit, $\frac{1}{2}$ ton	0 62
— in tierces	0 15	Sumac, $\frac{1}{2}$ bag ..	0 4
Sugar in tierces	0 13	Marble, $\frac{1}{2}$ ton	2 0
Barrels molasses	0 8	— statuary.....	1 0
Dry barrels	0 5	Rice, $\frac{1}{2}$ tierce	0 10
Sugar in boxes ..	0 10	Brandy, $\frac{1}{2}$ ton ..	0 40
Brazilian ditto	1 0	Staves, $\frac{1}{2}$ 1,000 ..	3 0
Tobacco in bales	0 6	East India cargo, $\frac{1}{2}$ ton	0 50
Cotton	0 10	Ballast	0 45
Lead, $\frac{1}{2}$ ton	0 45	Coal	0 45
Scrap iron, loose, $\frac{1}{2}$ ton	1 0	Green hides, $\frac{1}{2}$ bundle	0 5
Other iron, $\frac{1}{2}$ ton	0 75	Tobacco in hogsheads ...	0 30
Logwood, &c., $\frac{1}{2}$ ton	0 75	— in boxes	0 4
Rio Coffee, $\frac{1}{2}$ bag	0 3 $\frac{1}{2}$	Lard in kegs ..	0 2
All other coffee	0 3	Timber, $\frac{1}{2}$ 1,000	3 0
Sugar in bags ..	0 3	Corn in sacks	0 3
Salt in bulk, $\frac{1}{2}$ 1,000, small ves.	12 0	Nuts in bags	0 3
Salt in bulk, $\frac{1}{2}$ 1,000, ships		Pea nuts in bags ...	0 3
and barques, $\frac{1}{2}$ ton.....	0 50	Mahogany and machinery, $\frac{1}{2}$ ton	1 50
Ditto in sacks, $\frac{1}{2}$ ton.....	0 50	Coal oil	0 10
Lumber, $\frac{1}{2}$ 1,000	1 0	Chrysolite, $\frac{1}{2}$ ton	0 50

NEW YORK.

List of Prices adopted 28th March, 1869.

<i>Loading.</i>	\$	c.	<i>Loading.</i>	\$	c.
Flour, $\frac{1}{2}$ barrel	0	7	Barrel staves, $\frac{1}{2}$ 1,000	2	0
Naval stores, ditto	0	10	Grain in bulk	12	50
Petroleum oil, ditto	0	12	Kegs of nails, small and large .	0	4
Cotton, compressed, $\frac{1}{2}$ bale ...	0	55	Bales of hay	0	10
Cotton, by hand, $\frac{1}{2}$ bale	0	37 $\frac{1}{2}$	For all grain carried from boats,		
Grain, $\frac{1}{2}$ 1,000 bushels ...9 to	12	0	or bags held in or on wharf		
Ballast, $\frac{1}{2}$ ton	0	45	extra charge of 1 cent. $\frac{1}{2}$ bush.,		
Coal	0	50	the extra to be paid by shipper.		
Hogsheads sugar	0	50	In single-deck vessels	12	50
— molasses	0	60	Cotton, $\frac{1}{2}$ bale	0	25
— bark	0	50	Casks of oil	0	75
— corn meal.....	0	20	Boxes of bacon.....	0	20
Hoop poles, $\frac{1}{2}$ 1,000	0	90	Boxes of sugar	0	20
Lumber	0	80	Lime, $\frac{1}{2}$ hogshead	0	30
Tierces of all kinds	0	6	Coal oil on Delaware	0	10
Barrels of flour	0	4	— Schuylkil	0	10
Wet barrels	0	5	Logwood, $\frac{1}{2}$ ton	1	0
In double-deck vessels, wet ...	0	6	Rags, $\frac{1}{2}$ bale.....	0	30
And all other small cargo to			Goat skins.....	0	30
be rated in barrels at	0	4	Trundles, $\frac{1}{2}$ 1,000	3	0
Shooks and heading, $\frac{1}{2}$ barrel	0	4	Empty hogsheads.....	0	10
Bricks, $\frac{1}{2}$ 1,000	3	0	Empty barrels	0	5
Railroad ties	0	8	Oil cake, $\frac{1}{2}$ ton.....	0	50
Stowing ship timber	3	50	Havana and California cargo $\frac{1}{2}$ 3		
Assorted cargo in hogsheads...	0	25	$\frac{1}{2}$ day for the men, and $\frac{1}{2}$ 5 $\frac{1}{2}$		
Pipe staves, $\frac{1}{2}$ 1,000	3	50	day for the master stevedore.		
Hogshead ditto	3	50	Machinery by the day's work.		

The above prices do not extend to vessels with three decks.

STEVEDORES' CHARGES AT BALTIMORE, U.S.

	c.
<i>Discharging</i> iron, copper ore, and general cargoes, $\frac{1}{2}$ ton	40
Sugar or molasses, $\frac{1}{2}$ hogshead	25
<i>Loading</i> — Oil, $\frac{1}{2}$ barrel	10 to 15
Tobacco, $\frac{1}{2}$ hogshead	40
Coal, $\frac{1}{2}$ ton	40
Flour, $\frac{1}{2}$ barrel	3 to 4
Grain, $\frac{1}{2}$ 1,000 bushels	10
Dunnage wood, $\frac{1}{2}$ cord	\$10 0

SHIPPING WEIGHTS AND MEASURES.

Wheat, $\frac{1}{2}$ bushel.....	60 lbs.	Oats	32 lbs.
Indian corn or rye	56 lbs.	Petroleum oil stows 7 barrels to	
Barley	48 lbs.	the register ton.	

1071. STICK LAC ; see the article lac. Bengal and Madras ton 50 cubic feet in cases, 16 cwt. in bags.

1072. STONE CARGOES, being heavy, should be kept well up from the ship's floor, by which she can be laden and discharged readily, and will obtain a better equilibrium at sea. There are two difficulties connected with the freightage of stone. The *first* has reference to its weight or specific gravity, which is estimated by comparison with water, a cubic foot of which weighs 1,000 ounces, and the same quantity of Bath stone 2,510 ounces more than double ; granite yet heavier 2,662, &c. It is impossible to state correctly how many cubic feet of different descriptions will weigh 20 cwt., but it is necessary when chartering, that masters should be able to make some calculation. The following table, which is only approximate, may assist them. The second column shows the

STONE FREIGHTAGE.

1	2	3	4	5
Description.	Specific gravity.	Cubic Foot.	20 cwt.	Number of feet to the ton for freight.
Bath stone.....	2'510	157'0	14½	16 or 17 cubic feet
Caen				17 cubic feet
Craigleath	2'362	147'6	15	
Dundee	2'621	163'8	13½	
Granite, Dartmoor ..	2'662	166'4	13½	Dartmoor 15 feet*
— Aberdeen ..	2'625	164'0	13½	
— Penryn			13½	15 cubic feet
— Cheesewring ..			13½	15 cubic feet
— Penzance ..			13½	15 cubic feet
Guernsey blocks	2'710	168'0	13½	Meas. ton say 20 cwt.
Limestone, Plymouth	2'720	170'0	13½	12 or 13 cubic feet
Marble, white	2'706	169'0	13½	13 cubic feet
— Carara	2'716	170'0	13½	
Paving stone.....	2'416	151'0	15	14½ cubic feet
Porphyry (red)	2'871	179'0	12½	
Purbeck	2'601	162'6	13½	
Portland stone	2'113	132'0	17	16 ft. 7/8 ton of say 22 cwt.
Slate, Welsh	2'752	172'0	13	
— Roofing	2'672			
— Drawing	2'110			
Yorkshire landings ...	2'450	155'0	14½	Flags 7/8 ft. sup., thick-

* Granite is sometimes sold 20 cwt. to the ton, and so freighted. Ordinarily, 4-inch paving block granite occupies 14 cubic feet to the ton, or thereabout ; 3-inch blocks a little more ; and 6-inch a little less ; Guernsey blocks of the same dimensions a trifle less ; but 14 cubic feet may be taken generally as the space for a ton.

+ 15 cubic feet of Yorkshire landings usually go to a ton.

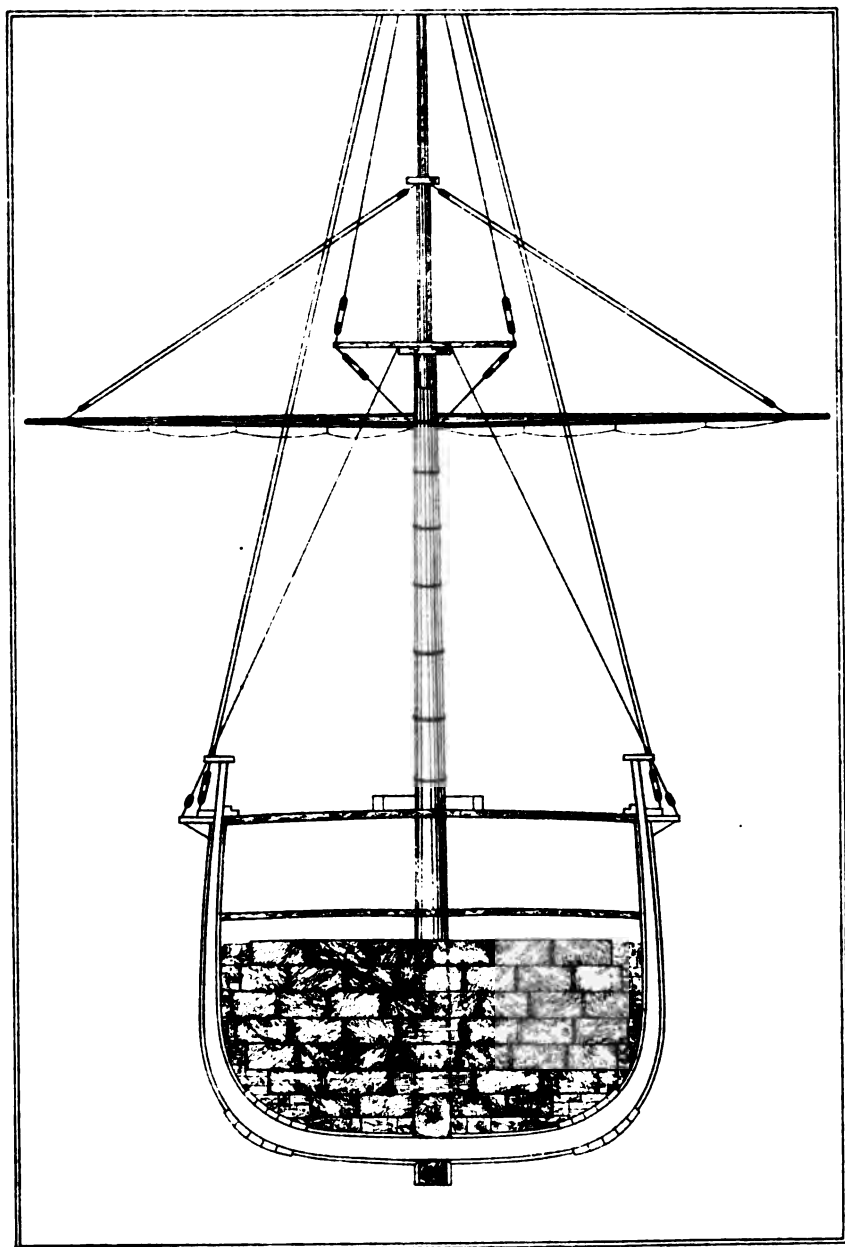
On the Forth and Clyde Canal 14 cubic feet of granite and whin stones, and 12 cubic feet of marble, go for a ton freight.

average specific gravity, in ounces, of each description of stone ; this of course is the only criterion of its weight, but we must not forget that there is a variation in the weight of the same kind from different quarries, and that stone from the same quarry will differ in weight according to the time which has elapsed since its removal, and according to the amount of its subsequent exposure to the atmosphere—Bath and Portland especially. Where there are no instructions under column 5, 'number of feet to the ton for freight,' reference can be made to other stone—one of about the same specific gravity—and an estimate formed accordingly. The discrepancy between column 4, which gives the number of feet cube to a ton of 20 cwt., and column 5, which gives the customary measurement for tonnage for freight, which is in some cases less, although in practice it is much more, is explained subsequently.

1073. The *second* difficulty regarding freightage, and one of far greater importance, arises from the mode of estimating the freight of some kinds. Where a ship will carry 100 tons of coal, which measures 40 cubic feet to the ton, it is but natural to suppose that she would carry 100 tons of stone in block, which in no case measures 20 feet to the ton ; but through the mode of measurement such is not always the case. When stone for building is required to be dressed, contractors usually purchase from the merchants stone in the form of rough scappled blocks, and dress them to the required shape and fineness, on the ground adjoining the work, to prevent the injury which dressed stone would be almost certain to sustain in its carriage by vessel, from the quarry or yard to the place where it is to be used. In such case the merchant always allows at *least* one or two inches on its length, breadth, and thickness more than the stone is required to be when finished. Sometimes 3, 4, and even 5 inches are left on one of its dimensions, and hence arises the anomaly of what is termed "**Long Tonnage**" for stone freight. An example may make this more clear.

A Contractor requires a stone to measure when finished	ft. in.	ft. in.	ft. in.	ft. in.	
	3	4 × 3	4 × 1	4=14	10, say 1 ton.
He orders the Merchant to send him a scappled stone block to clear that size. To do this the stone must be at least	3	6 × 3	6 × 1	6=18	5 1½
Those employed by the Mer- chant to cleave the stone, find beds in it which allow them to cleave it more eas- ily—say	3	9 × 3	9 × 1	7=22	3 1½

STEVENS ON STOWAGE.



DRESSED GRANITE.

The stone is sent away this size for shipment, but being invoiced to the contractor at 14 feet 10 inches or one ton, the master will receive a freight for one ton only, and not for $1\frac{1}{2}$ tons, which the stone actually weighs, unless the master makes a previous arrangement to meet the over-weight.

1074. **Granite** is usually put on board by crane gear provided by the merchant, with good strong sling chains and strong hooks, if the vessel is of sufficient hatchway to let the blocks down clear; but if the blocks are very large, the best mode is with lewises. Good wood dunnage should always be provided, so that the corners of heavy blocks may not bear on one timber, but give a share of the weight to several. In the West of England when stowing granite for London, say in a vessel of 300 tons burthen, the ground tier each side the keelson is kept well up from the skin by stout dunnage, care being taken that each block shall have a bearing on two or more frames of the vessel. The next tier is laid on it; the middle blocks are laid across the keelson, resting, if possible, on two of the ground tier blocks. The end blocks of both tiers are well dunnaged from the bilges, and all the blocks are kept $1\frac{1}{2}$ or 2 inches asunder by dunnage, so as to admit the sling chains readily when unloading. The third tier the same, and so on. The upper tier under the main hatchway will probably be $2\frac{1}{2}$ to 3 feet below the deck beams. The cargo forward and aft of the hatchway, will of course not rise so high, but will taper off towards the ends according to the vessel's build and trim, taking great care that all the blocks are so secured as to prevent them from starting when she rolls or pitches. The sketch herewith, say for a vessel of 500 tons, exhibits the tiers much more regularly disposed than can be accomplished with ordinary cargoes of granite which with regard to both sizes and weights are frequently very irregular, and therefore demand both skill and foresight on the part of the master. Where the stones are of irregular shape, considerable nicety of judgment is requisite to prevent damage, especially when the blocks are finally dressed. In reference to the freight of granite in the West of England, another authority puts the case as in the table following :—

DRESSED OR SCAPPLED STONE.

	ft. in.	ton. cwt.
Actual weight West of England about	13 0	1 0
Freight trade allowance for dressed stone	15 0	1 0
Freight trade allowance for scappled stone, taking dimensions that the stone will be "when dressed"	15 0	1 0
Thus taking total of several scappled cargoes "to dress to average" } of 2ft. 6in. × 2ft. 9in. × 3ft. 0in. dimensions." } or 4ft. 0in. × 2ft. 9in. × 2ft. 8in.		.
Actual measurement and weight would be	10,627 5	817 10
Actual measurement and trade weight would be	10,627 5	708 10
Scappled—measurement "dressing dimensions" and trade weight accordingly would be	9,572 0	638 10

The above shows that there ought to be a clear understanding as to whether dressed or scappled stone is to be shipped, for by the table it will be seen that a master may carry stone weighing 817 tons 10 cwt. and be paid freight for only 638 tons 10 cwt.

Kerb cargoes are stowed lengthways, *fore and aft*, one stone on another to prevent the breakage which would occur in transverse stowage. Granite is deteriorated by contact with oil. In the Thames the crew usually place the pitching into the barges alongside. In China, granite dressed for window sills, door steps, &c., is shipped for ballasting cassia and other light freight, when bound to Singapore &c. **Cornish Granite**, dressed or worked, has been found to weigh 20 cwt. to 13½ cubic feet exactly, which gives 2,654 ounces to the cubic foot, being just the same as in the tables. The customary rate for tonnage is 14 cubic feet of some granites, and 15 cubic feet of others, as Penryn, Penzance, and Cheesewring; and when the cargo is scappled only, the measurement for freight is exclusive of the waste for dressing; an equivalent should be reckoned for this in the rate of freight. From Guernsey to Plymouth 20 cwt. to the ton. Granite shipped at Looe, dressed for a dock at Copenhagen, weighed 7 ½ cent. against the ship, say 107 instead of 100 tons. The same not dressed 112½ to the 100 ton. On the Crinan Canal, 14 feet of granite and whin millstones go for a ton freight.

1075. **Limestone.*** A sloop carrying 53 tons weight of rubble

* The Trinity Corporation ordered 26th May, 1849, that vessels taking limestone as ballast, not exceeding in quantity one-third their register tonnage, and which is not sold for agricultural, building, or manufacturing purposes, be exempt from payment of light dues.

limestone was down to her load-line on five occasions, with 34, 36, 38, 41, and 42 measurement tons of rough granite. A sloop carrying 60 tons limestone, took on one occasion only 40, and on another 36 measurement tons rough granite. Quantities of limestone are conveyed from Welsh ports to Bideford, in polacca-rigged schooners, which skilfully drop their lofty fore-topsails when crossing the dangerous bar, and run to the mud near the kilns. A portion of the cargo is thrown on deck, to give a list inward ; and the discharge is soon accomplished by the help of women, shipped at Appledore on entering the Tor, and landed again on departure. Having the choice of three ports of loading, six trips are sometimes made in a week. The vessels are light-handed and worked by shares ; about 80 tons are dropped each trip, and 20 retained for ballast. In the United States, a barrel of water-lime weighs 300 lbs.

1076. In the Liverpool County Court, 16th July, 1865, Mr. C. W. POLLEXFEN, agent for the Sligo Steam Navigation Company, sued Messrs. FRAZER and BOND, for £32 16s. 4d. freight and dues on stone conveyed on the 10th and 17th April, per steamer *Sligo*. Defendants paid into court £22 18s. 9d. as settlement in full. The difference arose through one side calculating the freight on the cubic measurement, which took into consideration the various vacant spaces which were made by the projections from the stones. It was stated to be the custom in Galway as well as the actual bargain, to pay freight on the measurement of the stones themselves. Mr. ABBOTT, the shipper, proved that the amount paid in was sufficient to cover the freight on this basis. Mr. Sergeant WHEELER considered that there had been a positive agreement to charge on the actual weight, and as defendants had proved on that weight, he must return a verdict in their favour.

1077. **Millstones** vary in size from 55 to 72 inches in diameter, by 9 to 12 inches thick, and are stowed the same way as grindstones. **Yorkshire** Landings and Paving are stowed on edge, fore and aft, so as to prevent breakage, and have an equal bearing along the vessel. At Odessa, a Russian cubic sagan of coblestones, fit for pavement, is equal to 343 cubic feet English, and a square sagan of hard flagstones, good for footpaths, 49 square feet. **Portland Stone** is often taken on board by means of derrick and gear, which can be obtained at the island. The men there load the vessel, and she has to pay out of her freight 1s. 3d. ϕ ton for this service. At Charmouth, Dorsetshire, **Char Cement Stone** and Blue Lias are sent off in boats marked at the stem, stern, and sides, so as to show the weight contained ; this guides both the merchant and master. The boats are tested from

time to time in respect to their absorption of water, mud, &c., and re-marked if necessary. **Portland Cement** is becoming a great article of export; it weighs 100 to 110 lbs. per bushel. **Chalk**, specific gravity, 2.784; a cubic foot 174 lbs.; 13 cubic feet nearly 20 cwt.

PAVING STONES—SIZES to 20 Cwt.

Description.	Thick.	Size.	Description.	Thick.	Size.
	inches.	ft. sup.		inches.	ft. sup.
Yorkshire .	2½	70	Granite ...	3	54
Ditto	3	50	Ditto	6	27
Parbeck ...	2½	68	Ditto	7	23
Ditto	3	56			

WEIGHT OF YORK PAVINGS, PER SQUARE FOOT.

2 inches	26 lbs.	4 inches	52 lbs.
2½ "	32 lbs. 5 ozs.	4½ "	58 lbs. 5 ozs.
3 "	39 lbs.	5 "	65 lbs.
3½ "	45 lbs.	6 "	78 lbs.

1078. **Grindstones** should, if possible, be always stowed on their edges; potsherds, when procurable, make a good bed; the great object is to prevent damage to the edges; sometimes they are stowed flat, one on the other, with sand between to prevent chipping. The shipper sends into the hold a man who is paid by the master. 26 chaldrons grindstones, mixed sorts, weigh 21 tons, and are equal in bulk to half a keel of coal or 425 cubic feet. On the Crinan Canal 16 cubic feet go for a ton; same for freestone. In the United States a ton of grindstones weigh 2,000 lbs. Grindstones vary in size from 10 to 56 inches in diameter, by about 2 to 8 inches in thickness; they are classed in eight different sizes, called *foots*, according to their dimensions, as in the following table:—

Denomi- nation.	Diam.	Thick.	No. in. Chald.	Denomi- nation.	Diam.	Thick.	No. in Chald.
ft.	in.	in.		ft.	in.	in.	
1	10	2	36	5	35	5	5
2	14	2½	27	6	42	6	3
3	21	3	18	7	49	7	1½
4	28	4	9	8	56	8	1

A Grindstone *foot* is 8 inches; the size is formed by adding the diameter and thickness together. Thus: a stone 56 inches diameter by 8 inches thick, making together 64 inches, is an 8-foot stone of 8 inches each foot.

GRINDSTONES—NEWCASTLE TABLE,

Showing the various sizes from 1 to 8 feet, the weight of each Stone and each Chaldron.

Denomination.	Diam.	Thick.	No. in Chald.	Weight of 1 Stone.		Weight of 1 Chaldron.	
ft.	in.	in.		cwt.	lbs.	cwt.	lbs.
1	10	2	36	0	12½	4	10
1½	12	2½	30	0	22½	6	15
2	16	2½	27	0	48½	11	79
2½	18	3	21	0	67	12	67
3	21	3	18	0	98	15	88
3½	24	3½	12	1	19½	14	6
4	28	4	9	1	76½	15	17
4½	32	4½	6	2	68½	15	75
5	36	5	5	3	78½	18	44
5½	39	5½	4	4	84	19	0
6	42	6	3	6	11½	18	5
7	49	7	1½	9	61½	14	36
8	50	8	1	14	28	14	28

1079. **Marble** in blocks should be stowed on the flat of the floor, in the middle of the vessel, taking care to have good dunnage so as to prevent other portions of the cargo from damaging it. Some merchants consider that slabs of marble are more safely carried when stuck together with plaster of Paris. At Leghorn, wrought marbles and statuary are measured by the *palmas*, and the rough parts (like granite) make the tonnage for freight very heavy, but as the exports there consist usually of light goods, the shipment of a few additional tons of marble may be convenient for trimming. All packages and cases should be stowed with the right side up, or breakage may take place. When loading or unloading, proper guys should be used, for if the slings catch against the combings of the hatchways, the cases will instantly slip through and their contents be broken to pieces. English marbles are more brittle than *Bardilla* or *Carara*; a ton of the latter admeasures 12½ cubic feet. On the *Crinan Canal*, a ton is 12 feet. No goods of a greasy nature or in any way liable to leak, should be placed over or near marbles; two drops of oil will spoil a fine slab; great attention is required to this fact, especially when loading at Leghorn and Genoa, where marbles and oils are frequently stowed in the same hold. Rough blocks and slabs, shipped at Leghorn in December, 1858, were stained and damaged by bark stowed on the marble. Sugar, especially if damp, is exceedingly injurious. The expectoration from those who use tobacco is very detrimental; indeed its use ought to be prohibited

while receiving or discharging marble. Water, especially salt-water, will create stains, and if water enters packages, the nails will rust, the straw become rotten, and the contents rendered valueless. Oak and mahogany shavings when wet greatly discolour marbles. Masters have been cautioned against signing bills of lading at Leghorn, otherwise than "to be re-measured at port of discharge, and freight paid accordingly." Masters may lose eight or ten per cent. freight, unless they use this or some other means of security. A master asks the *Gazette*, 10th February, 1866: "I chartered my vessel at Leghorn to take cargo of general goods, including a certain quantity of marble, in blocks, for Bristol. The stevedore employed was furnished compulsorily by my merchant, and was considered a proper and competent person, and was paid by me, but at the risk of the ship when loaded. I obtained from him a certificate that the cargo was stowed in a proper manner, according to the custom of the port. On discharging at Bristol, it is found that two scantlings of marble are broken, and the consignee insists on deducting £10 12s. from my freight, alleging that the breakage was through improper stowage. The blocks when shipped appeared in good order and condition; but further than that I know nothing." The Editor answers: "If the stowage was expressly reserved to be at the 'risk of the ship,' and the master took 'no further trouble about the stowing of the cargo than to know nothing further about it,' than that 'it appeared to be in good order and condition when shipped,' the ship is liable if the breakage turns out to have accrued from bad stowage. The mere employment of the shipper's stevedore does not necessarily exonerate the ship from the consequence of bad stowage."

1080. **Emery Stone.** Nisi Prius, 26th April, 1861. **LEVANT MINERAL CO. v. SHEERS.** An action to recover £120. Plaintiffs shipped at Smyrna 107 tons emery on board the *Allegro*, which was put on the bottom; on it defendant placed some loose boards for the reception of a quantity of cases of liquorice paste, which having become heated, melted and flowed down between the boards upon the stone. On arrival in London, 40 tons appeared to have been considerably damaged, and was sold at a loss of £3 per ton. Experiments were tried by hot-water and burning, but not with perfect success. Defendant contended that the £30 paid in was all for which he was liable, because the damage might have been reduced by saturation. It was admitted that plaintiffs were entitled to recover the actual damage sustained. Witnesses for defendant stated that by immersing the stone in cold water for short periods, in some cases half-an-hour only, the liquorice completely disappeared, and

that this process might be carried on at an expense of 5s. $\frac{1}{2}$ ton. During the trial a piece of stone covered with liquorice, and produced by the plaintiffs, was placed in a pail of water in the court, and upon its being taken out two hours afterwards, the stone was almost clean, without scrubbing or friction. Damages £50 above the amount £30, paid into court.

1081. **Slate** is as brittle as earthenware and requires equal care ; it should never be shipped in wet weather ; slate ought to be stowed on its edges and kept in that position ; when flat it will be very liable to break. It must be stowed athwart and not fore and aft, otherwise when the ship pitches, great destruction must ensue, beside which if stowed fore and aft, and the slate settles wedge fashion, the ship's sides must strain. With general cargo, slate should be stowed on as level a surface as possible, which with coal or ballast can be easily arranged. The ground tier with edges down, and fore and aft, right athwart the hold, the longers carried fore and aft to the extent required for containing the quantity to be shipped, care being taken to keep the edges level. The next riding tier should be on their flat, and so on alternately ; the flat tiers should be as shallow as is consistent with the strength required to resist the weight of the overlying tiers, without breaking ; the object for stowing a flat tier alternately is to prevent the upper from wedging themselves down by the working of the ship, among the lower tiers, by which they would be broken. Some use only thin plank or strips of wood for a flat tier. Stowed carefully this way, straw, which is frequently used, is not required. At Calcutta, on opening the hatches of a ship from England, her hold was discovered to be full of a dense steam, the heat from which compelled the crew to retire for some time. Part of her cargo consisted of slate packed with straw, so wet originally that there is little doubt the ship would have been destroyed had the weather detained her longer at sea. Slates will not bear heavy cargo on them. Flooring slates (slabs) are stowed on their edges. For the Australian colonies and America, slates should be packed in boxes containing, say ten dozen in each, and large slabs should be enclosed in rough wooden cases, to preserve the corners and edges. Little else but *sized* (squared) slate is ever exported from the West of England—a cargo of scantlings being very rare. Quantities are sent thence to France and Germany ; scarcely any to America. 21 tons of slate occupy a space of 567 cubic feet, or two-thirds of a keel. On the Crinan Canal, 800 slates sizeable, go for a ton. A superficial foot of slate slab, one inch thick, weighs 14 lbs.

WEIGHT AND SIZES OF BANGOR SLATES.

Denomination of Slates.	Sizes.	1 Best Blue.	2	3	Green.
	inches.	cwt.	cwt.	cwt.	cwt.
Princesses	24 x 14	75	85		
Duchesses	24 12	60	81	100	81
Marchionesses	22 12	55	70	90	70
Countesses	20 10	40	53	60	53
Viscountesses	18 10	36	47	55	47
Small Countesses ...	18 9	34	44	63	44
Wide Ladies	16 10	31	42	50	42
Large ditto	16 8	25	33	37	33
Small ditto	14 8	22	25	33	25
Large Doubles	13 7	16	20	25	20

As an allowance of 60 slates over in every thousand, and one cwt. in every ton, is made at Bangor, to cover breakage at the time of shipment, the purchaser never paying for any excess he may receive beyond the quantity invoiced, viz., 1,200 to the thousand, and 20 cwt. to the ton, no abatement or further allowance is made for any deficiency or breakage that may occur in shipment or otherwise. Shipping 10d. $\frac{1}{2}$ ton, slabs 1s. 4d.

WEIGHT AND SIZES OF DELABOLE SLATES.

Description.	Size.	1st Quality.		2nd Quality.
		Average Weight.	Estimated surface.	Average weight.
	inches.	cwt.	sq.	cwt.
Princesses ...	30 x 15	115 $\frac{1}{2}$ 1,200	164 $\frac{1}{2}$ 1,200	
— ...	28 14	97 1,200	144 1,200	
— ...	26 13	82 1,200	124 1,200	
— ...	24 14	76 1,200	124 1,200	
Duchesses ...	24 12	65 1,200	11 1,200	80 $\frac{1}{2}$ 1,200
Marchionesses	22 12	59 1,200	94 1,200	70 1,200
—	22 11	54 1,200	9 1,200	65 1,200
Countesses ...	20 10	43 1,200	74 1,200	51 1,200
Viscountesses .	18 10	39 1,200	64 1,200	47 1,200
—	18 9	35 1,200	6 1,200	40 1,200
Ladies	16 9	28 1,200	54 1,200	33 1,200
—	16 8	25 1,200	44 1,200	30 1,200
Small Ladies .	14 8	21 1,200	4 1,200	25 1,200
—	14 7	19 1,200	34 1,200	22 1,200
Doubles	12 7	13 1,200	24 1,200	
Rags	Various Sizes.	17 doz. $\frac{1}{2}$ ton	... ..	20 doz. $\frac{1}{2}$ ton
Scantle	—	13 cwt. $\frac{1}{2}$ 1,000	14 $\frac{1}{2}$ 1,000	

100 feet of 14-inch flooring weigh about one ton. An allowance being made at the time of shipment to cover the ordinary breakage, no further allowance will be made for any deficiency; and the slate when shipped is at the risk of the purchaser. Shipping charges 9d. $\frac{1}{2}$ ton, slabs 1s. The weight of slate from the great South Devon Quarries, near Ivybridge, is between that of the Delabole and Bangor, not being so heavy as the Delabole slate.

1082. STOPPAGE IN TRANSITU. This expression means that the *unpaid* seller or the consignee of goods has a right on the bankruptcy or insolvency, or approaching bankruptcy or insolvency of the purchaser or consignee, to countermand, before or on arrival at the place of destination, delivery of these goods to that purchaser or consignee. Into the general principles on which right is founded, and to the many questions which may arise out of the exercise of it, the shipowner or shipmaster does not require to enter. The master is merely a *common carrier*; and by his bill of lading he has undertaken to deliver the goods to the person named in it, or *his assigns*, that is, to the party to whom he has legally transferred his rights under it; or the bill of lading is taken for delivery to the order of the shipper, himself, or to, or order, or *assigns*; and in these cases the master can only deliver to the party to whom the shipper has duly endorsed the bill of lading, or who holds it from the shipper with a blank endorsement.

1083. When the ship, on board which the goods are, has to perform quarantine before entering her port of destination, and the goods have to be purified before being admitted—the *transitus* continues until quarantine be performed; and, therefore, during the performance of it, the seller is in time to stop, and this right will not be defeated by any act done by the buyer during that time. When the ship has arrived at her port of destination, and complete delivery of part of an entire cargo or parcel of goods is made to the consignee, without any intention on the consignor's part to retain the rest, this is held to be a complete delivery of the whole, so as to terminate the *transitus*. As, where a cargo of wheat was shipped and bills of lading taken, deliverable to the buyers, and a bill drawn and accepted for the whole, and the buyers sold the wheat to a third party, and, on the ship's arrival, the cargo was entered at the custom-house in the name of *his* agents, who took out 800 bushels on his account; but, on the failure of the first buyers, the original sellers gave notice to the master to stop delivery:—it was held, however, that the *transitus* was ended, by the delivery of the 800 bushels, which must be taken to be a delivery of the whole, no intention appearing, either previous to, or at the time of the delivery, to separate part of the cargo from the rest.

1084. Shipowners, masters, and brokers are oftentimes perplexed to decide as to whom goods are deliverable under bills of lading. The practice which now prevails, of making two sets, renders it easy to present a second endorsed document for the delivery of one shipment. The reason for having two sets of bills of lading must be

apparent to all acquainted with mercantile affairs; by the duplicate copies the cargo can be re-assigned to another firm at the port of discharge, by way of stoppage *in transitu*. Thus, if a manufacturer agrees to sell goods to a merchant, and ships off the consignment, forwarding the bill of lading in due course, and subsequent to shipment, discovers that the buyer is a swindler or insolvent, he can by the extra copies of the papers referred to, post off the endorsed bill of lading to another house, and by this means claim the cargo at destination. Agents and shipowners are, therefore beset and threatened with legal proceedings by both parties to the bill of lading. Withholding lawful delivery of merchandise is accompanied with evils, as actions for compensation are taken, and a ship is often detained pending the settlement. In a foreign port, where a master is told that his ship will be arrested and held to bail for non-delivery by two claimants, he is afraid to act. It is true, by giving up the goods, he may be paid the carriage thereon; still, if he is served with processes on both sides, the danger is not lessened of having to answer suits for loss of markets, depreciation in values, or other similar claims. The original consignees and holders of first bills of lading ought to be the parties to whom the goods should be delivered; but the consignor by entering a protest, and serving the master with sufficient notice, frequently causes goods to be stopped, as before mentioned, or handed over to a second person. The ship is therefore made an intermediary in these affairs, much to the annoyance, and at times the expense of the shipowner. We have given instances, on a former occasion, wherein second sets of bills of lading were made for fraudulent purposes; and the records of our criminal courts have revealed the fact of cargoes being sold a second or third time. The presentation of two separate copies of bills of lading for the delivery of goods is of ordinary occurrence, but each case has some distinguishing feature.

1085. The action tried before Mr. COOKSON in the Supreme Consular Court at Constantinople, the details of which were reported in our columns a few days ago, will serve as a sample of the difficulties surrounding a shipowner or master, when more than one claimant applies for the same goods, and each having strong grounds for demanding possession. The case may be summarised as an illustration of stoppage *in transitu*. Messrs. MEYER and BUNGE, of Amsterdam, entered into a contract to sell the Messrs. SELIAN FRERES, of Marseilles, 500 barrels of sugar, and these were shipped on board the British steamer *Diana*, for London, for transshipment per *Montesuma* (s.s.) to Constantinople. SELIAN and Co. obtained an advance

of 50,000 francs on the sugar from Messrs. HAVA and Co., and these gentlemen consigned the same to Messrs. LEBET et FILS, their agents in Turkey. When the goods were *en route* to Constantinople, Messrs. SELIAN FRERES, the purchasers, became bankrupt, and MEYER and BUNGE, as unpaid vendors, telegraphed, through their agents, to Mr. LAMB, not to deliver the sugar to the holders of the bills of lading. The agents of the vendors, and those also of the pledgees, claimed the sugar at Constantinople, and both commenced actions for its recovery. Mr. LAMB, therefore, the representative of the steam-ship company, entered an interpleader suit in the Consular Court to decide as to whom the goods should be delivered. The contract was made in Holland, by Dutch subjects, where the first endorsement was made; the purchasers were Frenchmen; the bills of lading were sent, and endorsed to a French firm in Turkey; but the goods were on board an English ship, and the defendant to the suit was a British subject, being the representative of the carriers, and the holder *pro tem* of the goods. The laws of England, France, and Holland were pleaded *in extenso*, as governing such cases. The Court ruled, however, that, by the Dutch law, the vendors, Messrs. MEYER and BUNGE, had the right of stoppage; and also, that by the laws of France, there was no valid sale of the goods at Marseilles. It was attempted to be proved that the pledge was not legally constituted by Messrs. SELIAN, inasmuch as in the endorsement no mention was made, according to Art. 91 of the French Code, of the advance of money, and the holding of goods by the pledgees, by way of lien thereon for repayment. An endorsement passing the goods, it was argued, in reality constituted a sale, and that, therefore, MEYER and BUNGE would thereby forfeit their right of stoppage, and would have to fall upon the estate of SELIAN for the payment of their contract, with liberty to claim, under the laws of France, from the second purchasers, the price agreed upon, if it had not been paid over. The Court, however, considered that, by intrinsic evidence, the pledge, and not sale, was intended by Messrs. SELIAN to HAVA & Co., and that, therefore, by Dutch law, MEYER and BUNGE were bound to repay to the pledgees the sum borrowed, with costs, before they could reclaim possession of the goods. The sugar was to remain, subject to this decision, in the hands of the agents of the pledgees.

It is with reference to bills of lading in such complicated cases as these that a shipmaster is called upon to settle as to which, according to his judgment, are the proper parties entitled to the cargo. Mr. LAMB was attacked by counsel, in court, for detaining possession of the barrels of sugar, to the injury of the parties interested; but the

Judge remarked that "the rights of the two claimants were so very doubtful that he (Mr. LAMB) did perfectly right in withholding the goods from the presenter of the bills of lading, on the telegram which he received from the vendors, and bringing this interpleader suit. Further, while I fully agree in the opinion expressed by the respectable witnesses called on behalf of Mr. LEBET, that nothing could be more destructive to the security of credit and the interests of trade than a practice of transmitting two different sets of bills of lading, endorsed to different parties, yet, as in this particular case the second sets of bills of lading were transmitted direct to Mr. LAMB, there was, I believe, no fraudulent intention; but as the constructive stoppage of MEYER and BUNGE, by the telegram of 17th July, had already been complete, the device was quite useless, and, considering that they had already issued other bills, payable to order, and endorsed to other parties, it was of a very questionable character." To the shipowner, his captain or agent, it matters very little how reputable the transaction may be, or as to the honour of the parties to the transaction. A telegram from an agent, purporting to come from a consignor, is a warning, and nothing more. It is simply the messenger of what is to follow; but suppose the telegram turns out a hoax, is a master entitled to hold as against the endorsee of a bill of lading, on such an unattested notice? We should say that, under such circumstances, the master would be bound to pursue a cautious course, and take an indemnity bond against all eventualities. Mr. LAMB, however, adopted a prudent plan in submitting the case to judicial consideration. It has been recommended that only one set of bills of lading should be drawn for each consignment. This practice would, no doubt, simplify matters; but a custom prevails of drawing sets, and we do not see how it can be abolished without prejudice to mercantile interests. The usage is, unquestionably, open to abuse, and is accompanied occasionally by fraud. If, however, the rule is expedient, the exceptions must be met and dealt with, as they arise, on their own merits. A shipmaster has to look first to his lien for freight, and next that the goods are delivered to the holder of the endorsed bill of lading: if a second endorsement is presented, steps should be taken to free the ship from all liability.—*Shipping Gazette*, 19th January, 1870.

1086. STORES. Spars and other articles necessary for a ship's use are exempted by the Customs' Consolidation Act, 1853, from any general expression as cargo. A ship is allowed to carry as stores one spare spar of each sort she requires to use, which are, or should be, reported in the "manifest," under the head of stores. The larger

descriptions, such as lower masts or bowsprit pieces, are seldom carried except by the homeward-bound in the timber trade, which usually avail themselves of the opportunity, independent of the cargo.

1087. STRAW PLAIT. **Bill of Lading.** Common Pleas, 9th Nov., 1867. *OZECH v. THE GENERAL STEAM NAVIGATION COMPANY.* This was an action tried before Mr. Justice BYLES, when a verdict was found for plaintiff—damages £26. A rule *nisi* having been obtained to set aside the verdict and enter it for defendant, or for a new trial, on the ground that there was no negligence, and that the verdict was against the weight of the evidence. Plaintiff had shipped three bales containing straw plait on board one of defendants' steamers. They were safely put on board, but were found damaged by oil and dirty water on delivery. It was surmised that the damage had arisen from the leakage of some oil used to lubricate a donkey engine on board, and it was contended, therefore, that the damage arose from defendants' negligence, and that they were responsible, and the jury took this view. For defendants it was contended that the goods were shipped under a bill of lading which *excepted their liability from all damage by machinery, boilers, steam, leakage, and accidents of the seas or rivers*; and that, whatever damages had happened to the bales, it came within one or other of the exceptions in the bill of lading, and that they were not responsible.

The CHIEF JUSTICE said, as to the first point, that the verdict was against the weight of the evidence; the learned judge who tried the case had intimated that he was not dissatisfied with the verdict, and the Court were not disposed to disturb it on that ground. It must be taken that the jury, after hearing evidence on both sides, had properly found their verdict. It was then contended that the words in the bill of lading excepting from liability excluded the defendants from responsibility. On that point, assuming that there was negligence, he thought this case was not to be distinguished from that of "*PHILLIPS v. CLARKE*," in 1 *C. B. Reports*, where it was held that a shipowner was not relieved from responsibility for leakage where by the bill of lading damage from "leakage" was a liability he was to be exempt from when the leakage was occasioned by his own gross negligence. The further case referred to in the argument, of "*ORLOP v. BRISCOE*," in the Privy Council, distinctly held the owner to be liable in a similar case where the leakage was occasioned by negligence; and this Court had held the same in a case "*SVIEW v. DODGSON*," where cattle damaged and killed by the rolling of a vessel at sea had been sought to be recovered for, with a provision that the owner should be exempt from liability for such losses, where

the rolling of the ship was shown to have been occasioned by his negligence in not having the ship properly ballasted. The jury had determined the question that there was negligence, and it must be taken that the damage was occasioned on board ship by the negligent upsetting of some oil can ; and, therefore, on the true construction of the bill of lading, the defendants were not absolved from the consequences of their negligence by the exceptions provided against. Rule for new trial refused. Shipowner made liable, notwithstanding a supposed protective clearance in the bill of lading.

1088. SUCCADES. Ginger and various tropical green fruits preserved in syrup, usually packed in jars and then placed in cases having framework inside. As the jars are generally full and liable to leak, they should not be placed near any goods which may be injured by the syrup ; the cases are very fragile and require much care in handling. Bombay ton 50 cubic feet.

1089. SUBSTANCES SOLUBLE IN WATER, and therefore capable of receiving injury and of causing injury :—

Aloes	Candy sugar
Alum cake or sulphate of alumina	Candied fruits
Acetate of lime	Cantharides
Acetate of lead or sugar of lead	Copper sulphate or blue vitriol
Acetate of copper	Divi divi
Acetate of soda	Epsom salts or sulphate of magnesia
Arsenic or arsenic acid	Galls, nut Aleppo
Argols or tartrates of potash	Gamboge
Ammonia carbonate	Gelatine
Ammonia sulphate	Guano
Ammonia muriate or sal ammoniac	Gum arabic, Tragacanth
Alkali or soda ash	Glauber salts or sulphate of soda
Barilla	Gum British or dextrine
Bleaching powder or chloride of lime	Gunpowder
Borax or tincal	Honey
British gum	Iceland moss
Brazil wood	Iron sulphate, copperas or green vitriol
Catechu	Kelp
Citric acid	Lead acetate or sugar lead
Copperas or sulphate of iron	Lime
Cream of tartar	Lime acetate
Coffee	— chloride
Chocolate	— superphosphate
Chloride of sodium or common salt	
Chloride of potash	
Camphor	

Liquorice	Salprunella (saltpetre)
Litmus	Salt, common, or chloride of sodium
Lucifer matches	Sal ammoniac or muriate of ammonia
Magnesia, sulphate of, or Epsom salts	Soda ash or alkali
Natron or crude soda	Soda carbonate
Nitrate of potash, saltpetre	— bicarbonate
Nitrate of soda, nitre, cubic nitre	— sulphate or salt cake
Oak bark	Snuff
Opium	Soap
Oxalic acid	Sugar
Oxalates of potash and soda	Tartar, cream of
Pearlash	— salts
Potash	Tartaric acid
— carbonate	Tea
— chlorate	Tincal or crude borax
— sulphate or sal enixum	Tobacco
— bichromate	Trona or crude soda
— prussiate	Vitriol, blue, or sulphate of copper
Phosphate of soda	— green, or sulphate of iron
Quick-lime	— white, or sulphate of zinc
Quinine	Verdigris
Rhubarb	Yeast, German
	Zinc, sulphate or white vitriol

1090. SUGAR. **French** beet-root sugars are of a very fine sort, packed in thin hempen bags, about 2 cwt. each; tare 3 lbs. shipped mostly from Dunkirk, Havre, Caen, and Nantes. From Germany the shipments are in casks of about 10 cwt.; tare actual. Many thousand tons of foreign refined sugars in loaves, are imported annually into Great Britain from France and Holland; generally in small vessels of 100 tons burthen. Great care is required in having sufficient wood dunnage below; the loaves are packed loose with straw throughout. The least wet or damp injures them seriously; it is therefore impossible to take too much care even in tight staunch vessels. In addition to being kept dry and unbroken, the loaves should be landed in a clean condition.

1091. Sugar was formerly so heavy that ships could not take a full cargo; the progress of refining has altered this condition of circumstances. **Ballast** is unnecessary if the ship be tight, excepting with sugar in boxes, which stow more compactly in the 'tween decks than on the skin, and are liable to make the ship crank. **Dunnage** not less than six inches on the floor and nine in the bilges, carried well up; it should be covered with mats or bags, to prevent the

loose sugar from being wasted among the dunnage ; see dunnage. To get two or three heights of hogsheads in low-decked vessels, the dunnage is sometimes diminished, but this is at the ship's risk. When the entire shipment consists of sugar, the hogsheads of the ground tier are placed close together, fore and aft, with strips of board up and down the ceiling ; after which every hogshead is duly bedded and chocked with billets of wood, and the riding tiers stowed in the same manner. Not unfrequently, where a third height cannot be had, it is usual to make up the balance of cargo with bags, barrels, or boxes : this, however, must depend upon the manner in which the sugar is shipped from the port of loading. When logwood is cut in the hold for dunnage, the saw-dust should be carefully removed ; if wetted, its colour will seriously injure sugars and other goods. When coker-nuts, logwood, sapan wood, piassava, canes, &c., are used as dunnage, and carried at a low freight in consequence, care should be taken to have the words " may be used as dunnage " inserted on the bill of lading, or the ship will be liable for any damage sustained by such articles.

1092. Sugars in casks are mostly Muscovado sugar, *i.e.* partially drained of their syrups ; by drainage in transit they not unfrequently lose 16 $\frac{1}{2}$ cent. of their weight. Clayed sugars are packed in boxes, cases, and chests, principally in boxes ; the syrups having been more perfectly separated from them they are but little liable to loss of weight in transit. Some unclayed sugars, such as unclayed Manillas, low Bengals, Madras, and Khaurs, are packed in mats and bags ; khaur is an inferior article, little better than molasses, and may lose 30 $\frac{1}{2}$ cent. through drainage. Syrup sugars should be stowed below every other part of the cargo, and as near the pump-well as possible, that the drainage may be drawn off more freely from the ceiling. With all sugar cargoes, some provision is necessary for the ready access of drainage to the limbers ; experienced masters open the lower part of the pump-casing full a quarter of an inch, and bore holes in the skin, but not in the shoulders, for the bilge-water there would fly up when the ship lurched, and do serious injury to cargo. Some wooden ships belonging to Messrs. SCRUTTON, SONS, & Co., of London, are provided with two tanks, each about a foot square, formed of $\frac{1}{2}$ -lead, and fitted usually near the pump-well. One is placed each side the keelson, between which and the keel is a pipe communicating with both wells, which are fitted so as to admit a free run of bilge-water below them. The lead forming the sides is brought out over the skin on which it is fastened. The ship's skin is caulked, and thus all the drainage runs to the wells, which are

provided with lead pipes running up to a copper pump (sometimes two) screwed into the deck. By this means all the leakage of the sugar is brought up and deposited in spare puncheons; in a ship of 371 tons register, laden at St. Vincents, as much as would fill 30 puncheons has been thus saved; 15 to 20 puncheons is the average. The heels of iron pumps are soon destroyed by sugar drainage; they should be of lead or metal in preference to iron or copper. Crystallized sugars sometimes occupy less space in the packages at the end of the voyage than at the commencement, thereby giving the impression that the packages were not full on shipment; this operates against the weight stowed in a ship, and masters should act accordingly. With sugars in bags the tiers between the beams should be carried well up before crossing, or the top pressure will burst the crossing bags when they come down to the beams, by the settlement of the cargo. With a hold 14 feet deep, cargoes have settled 3 feet 4 inches on the passage home. **Natal** sugars are in bags 1½ to 2 cwt.; the **crushing season** is from 1st November, to 28th February, but the climate being variable, it is carried on by the farmers, to a limited extent, throughout the year. **Sandwich Islands** sugars in bags and barrels, 2 to 4 cwt., are sent chiefly to California and British Columbia. Whenever sugar liable to drainage has to be shipped, care should be taken to provide a means for the drainage to get to the pump-well. Where this has not been done, the drainage has accumulated on the ceiling and destroyed the ground tier of hogsheads. To prevent this some masters bore holes in the ceiling; this is a bad plan, because if the vessel rolls the bilge-water may be forced up through these holes. A better plan is to lift a limber board on each side, before the pump-well, and having put a small batten under each end lay it down again; by this means the drainage will run under the limber board, while the bilge-water cannot wash up. Vessels that have not good large limbers (unless they have a platform) are unsuitable to carry green sugar. The pumps should be jiggered out every hour, even in a tight ship, for the tighter the ship the more chance of damage by drainage. For molasses, see the article molasses; and for jaggery, see East Indies—colonial, in this article.

1093. Capt. PARISH, E.I.Co., says—Some officers prefer stowing bags of sugar and saltpetre "on end," but more is required for pounding down if done so, or a large breakage will be left beneath them; generally speaking, time and space may be gained by stowing them on their flats, lifting up the ends and corners of adjoining bags, and launching them well home. The ground tiers should not be pounded, as it would displace them; but in stowing the other heights

a party, with commanders, should follow the stevedores, and beat all the bags down level. Sugar and saltpetre cannot be too much pounded; but the roller should merely be drawn over bags of rice, grain, or seeds, so as to level the contents. In granting shipping orders, "fine dry" should be specified, and care taken that one bag every now and then is examined. Instances have occurred where a shipping order for fine dry sugar having been taken, moist has been sent instead—an extra bag being sewn over it just before shipping, that the sweating through might not be observed.

1094. If possible, brown sugar should be stowed under white to prevent damage from drainage; damp sugars should be refused. Avoid those packed in a green state, as the moisture which results will be attributed to the ship, and deducted from the freight. After loading, one hatch ought always to be kept open, when practicable, to allow the steam to escape, as confinement without circulation is injurious; besides which, when leakage exists, the water will to a certain extent be warmed by the fermentation, and will consequently melt the cargo more. The bilge water of sugar ships is very offensive. In the West Indies large bamboos are let down into the cargo, leaving two or three feet above the level of the deck, to allow the steam to come up and fly off. All sugars are liable to steam, those in a green state especially, they are therefore never carried by first-class passenger ships, which take only fine dry sugars of the best quality. Ships carrying steaming sugars should use zinc paint, which remains unchanged while white lead turns black. If the ship be already painted with lead, discolouration may be avoided by covering with white-wash of slaked lime before loading. The injury from steaming is occasioned by sulphuretted hydrogen, which is very injurious to health; moistened lime or white-wash will absorb this gas and prevent such injury. Cargoes of sugar have been known to injure lead pumps, and to create leakage; all lead in pipes, &c., should be protected from sugar, which will by *contact* injure cutlery, marble, rope—coir especially, and other goods; by its *heat* fermentation and leakage from bottles and casks of ale, beer, wine, spirits, &c., will be created; and by its *steam*, which settles under the decks and drops on bales or chests below, teas and other delicate articles will be greatly deteriorated. Sugar has been known to "unsweeten" coffee and diminish its value; all sugars are liable to depredations from rats, and it should be well covered with mats to receive bales or cases of rice, &c.; see vermin.

1095. Some American-built ships are heavily masted, and their hulls, especially if of soft wood, which is often the case, are more

liable to become leaky in the wake of the channels. Masters so circumstanced, box off that part of the hold abreast of the channels, in order to secure the dryness of sugars or any other similar article.

1096. **West India.** After some West India sugars are boiled at the plantations, they are thrown into hogsheads (or tierces) the bottoms of which are pierced with holes to allow of the drainage of the syrup from the sugar, into the molasses' cistern, over which they are placed. Frequently the hogsheads are packed before the drainage is complete, and the remainder runs off on board the ship, causing a loss of weight which amounts occasionally to 16 ¢ cent. At Jamaica, after 200 hogsheads or more are on board, and the vessel is tight, the merchant or his overseer sends off to the ship for the molasses drainage, for which in return he gives the master a small cask of rum. When the vessel is leaky the drainage is not worth the cost of extraction. While the drainage at the plantations may amount to 25 ¢ cent. of the weight, the reduction of the *bulk* of the sugar may not reach 10 ¢ cent., and this loss of stowage, coupled with defective packing, will sometimes admit the loose contents of five hogsheads, when shaken by conveyance to the wharf, to be packed into three. St. Vincent hogsheads are generally well filled, and although rather smaller, weigh more than those of Jamaica, and much more than those of Berbice or Demerara. St. Kitts and Nevis hogsheads, of 40 inches truss, hold if full 20 cwt. ; 30 inches 15 cwt. ; tierces 9 cwt. ; barrels 2 cwt. ; 9 barrels usually go to a hogshead. Where proper attention is not paid when screwing hogsheads in the hold, hoops are cut through and more loss occurs by wastage, when unloading, than is gained by additional freight. The lowest tier is most liable to be crushed, and more so if the casks are not full or the sugar not sufficiently cured. The screw-jack is used too freely when driving in the upper tiers—the last especially. Some shippers hasten cargo on board to entitle them to draw bills on the consignee ; this is one of the causes of casks not being filled, and of their contents being only half cured. The bilge water of tight ships in the West India trade has been sold there for conversion into rum ; for the stowage of sugar and other West India produce see also general cargoes ; and for seasons of shipment, see rum. West Indias are usually packed in hogsheads, tierces, and barrels ; the tierces 10 to 12 cwt., hogsheads 15 to 22 cwt., averaging about 16 cwt. gross ; tares about 16 ¢ cent. The hogsheads from Porto Rico are the smallest, those from Trinidad and Barbadoes the largest. Cubas in hogsheads and tierces, commonly termed Cubas ; a Cuba bocoy is a cask containing 50 to 54 arrobas ; disputes have arisen through

stowing cases of sugar with hogsheads, in a cargo from Cuba. Havannah boxes are frapped with strips of hides; they measure on an average $3\frac{1}{2}$ feet long, 2 broad, and 1 foot 8 inches deep—say 11 cubic feet; and five of them generally make a ton gross weight; a hoghead usually weighs 1,300 lbs.; the average loss on Havannah cargoes is 2 to $2\frac{1}{2}$ per cent.

1097. Some islands are so mountainous that the sugars in many districts, are necessarily packed in hogheads of only 38-inch truss, or in tierces, which on several estates contain 11 cwt. only. The lesser packages are used in the hilly districts of most of the islands. In Dominica and St. Vincent there are a variety of packages suited to the different altitudes. Trinidad and Demerara are flat; here the trusses of the hoghead are 40 and sometimes 42 inches. The packages used in Demerara are generally very large. On the south side of Dominica the planters use skids from 400 to 500 feet long. A canoe having four men to pull and one to steer, with one tierce or two, according to the state of the weather, is allowed to slide down into the sea; if she escapes, well; if not, the men swim for their lives. The canoes convey the tierces to a drogher, which goes round to the north side of the island where the ship is moored in some safe place. At Trinidad, when a vessel has a full and complete cargo of sugar and molasses packed in puncheons and hogheads, though room for other packages is left, it is the custom to consider it a full and complete cargo. As considerable doubts exist regarding the weights of the various packages of sugars exported from the West Indies, the following extract from the Export Duties' Act, 29th November, 1860, may be of some assistance.

		<i>s.</i>	<i>d.</i>
SUGAR.	Hogsheads of 42-in. truss not exceeding 2,000 lbs.	6	8
	Ditto of 46-in. truss not exceeding 1,800 lbs.	6	0
	Ditto of 38-in. truss not exceeding 1,650 lbs.	5	6
	Tierce not exceeding.....1,000 lbs.	3	4
	Barrel not exceeding..... 250 lbs.	0	10
RUM ...	Puncheon not exceeding 120 gallons	2	6
	Hogshead not exceeding 60 gallons	1	3
	Other packages for every gallon	0	0 $\frac{1}{4}$

Rum is exported from the West Indies in puncheons, hogheads, quarter-casks, or demi-johns.

1098. At **Barbadoes** it is brought from the plantations into Bridgetown in cars drawn by bullocks, and then rolled on the wharf for shipment, where it is lowered into lighters or ships' boats by a small crane. Every shipper of produce has a crane, for the use of which each ship is charged.

1099. Lighterage for sugar is at 1s. $\frac{1}{2}$ hogshead, three tierces being calculated equal to two, and eight barrels equal to one hogshead. The weight of the hogshead averages between 18 to 26 cwt. (gross); tierces from 10 to 16 cwt.; and barrels from 250 to 300 lbs. Some of the large hogsheads are 47 inches in diameter at the bilge.

1100. Stevedores are employed to stow the sugar; their established charge is 1s. $\frac{1}{2}$ hogshead, and smaller casks in the same proportion, as before mentioned for lighterage; and they find and pay their own men—sometimes having four gangs of them (six in a gang) in the hold if the sugar is coming alongside quick. The ship's crew have quite sufficient employment in heaving the casks on board from the lighters, and lowering the same into the hold; the ship's long-boat being employed, with three of the crew, bringing off sugar at the same time.

1101. The rule for **dunnage** is five inches on the floors and nine at the bilge for sugar. Molasses is generally considered to be 5 $\frac{1}{2}$ cent. better as a cargo than sugar; with the former a vessel will load deep, which is not the case with the latter, unless the vessel is built for the trade and has a great number of barrels—which are not generally to be obtained. Molasses is shipped in puncheons of about 110 gallons, and the average weight of the same is 12 cwt. Seasoned casks are sent on board and then coopered (half of which is charged to the ship) before they are placed in the hold, where they are stowed empty; the casks are then bedded, quoined, and blown before being filled—the filling is done by means of a hose filled by starting casks at the hatchways.

1102. **Dunnage**, wood, and spars are scarce and dear; vessels proceeding to Barbadoes should be well provided with the former. A vessel loading molasses and not having dunnage staves must be purchased for the same, which are sold at \$40 $\frac{1}{2}$ 1,000 (1,200 being given as a 1,000); 3,000 would be required to dunnage a cargo. Vessels going to Barbadoes should be provided with two pairs of double screws, four crowbars, two purchase blocks, falls, &c., two derricks, and a winch; their boats should also be provided with masts and sails (the long-boat in particular) for droughing the sugar. *Primage*: sugar, quarter-casks and barrels 4d., hogshead 6d.; coffee, quarter-cask 4d., barrel 2d.; logwood, 6d. $\frac{1}{2}$ ton; rum, 6d. $\frac{1}{2}$ puncheon; molasses, 6d. $\frac{1}{2}$ puncheon. *Landing Tare*: under 8 cwt. 14 lbs. $\frac{1}{2}$ cwt.; 8 cwt. and under 12, 1 cwt.; 12 cwt. and under 15, 1 cwt. 1 qr. 12 lbs.; 15 cwt. and under 17, 1 cwt. 2 qrs.; 17 cwt. and upwards, 1 cwt. 3 qrs.

1103. Much of the sugar produced at **St. Kitts** is sent for ship-

ment to Antigua, which is a preferable place for loading. It is usually brought in droghers (fore and aft schooners) of about 100 tons, which have to go alongside a wharf to exhibit their cargo to the customs' officer, unless it happens that he is on board the loading ship. The island of Barbuda sends most of its produce to Antigua, the anchorage and depth not being good at Barbuda, where British vessels of from 200 to 300 tons only load, while at Antigua vessels of 1,000 tons will find good anchorage. Dunnage is not plentiful in Antigua: small mangrove grown on the island is generally used, but it is advantageous to the ship to take her own dunnage with her. At **Porto Rico** the planting season extends from August to March; the crop is usually over in July.

1104. At **Demerara** the stevedores' charges are—

Sugar, hogsheads, each	20 cents.
— tierces	16 „
— barrels	8 „
Rum, puncheons	16 „
— hogsheads	12 or 8 „
Hire of screw for a vessel 353 tons register ...	\$15

1105. At **St. Jago de Ouba** the stevedores' charges are—

	Cents.		Cents.
Sugar, hogsheads .....cach	15 to 16	Coffee, barrels	5
— barrels	5 to 6	— bags	5
— tierces	8	Cocoa, bags	5
— boxes	8	Tobacco, bales	8
Rum, puncheons	20	Mahogany, $\frac{1}{2}$ log	18
Coffee, hogsheads	12 to 14	Fustic, \$1 $\frac{1}{2}$ ton	
— tierces	8	Labourage, \$2 to 2 $\frac{1}{2}$ $\frac{1}{2}$ man $\frac{1}{2}$ day.	

Shipmasters receive a copy of the harbour rules on their arrival.

COMMISSIONS AT ST. JAGO DE OUBA.

For procuring a freight for vessels arriving in ballast	5 $\frac{1}{2}$ cent.
Ditto, with cargo	2 $\frac{1}{2}$ „
Collecting of freight	2 $\frac{1}{2}$ „
Disbursements of vessels with funds in hand	2 $\frac{1}{2}$ „
Ditto, without funds	5 „
On invoices	2 $\frac{1}{2}$ „
Sales, half generally returned	5 „
For guarantee on sales, nett cash	2 $\frac{1}{2}$ „

In accepting freights from Cuba, it should be borne in mind that cargoes of molasses and honey are not so profitable as sugar, for 224 gallons at 10 lbs. are reckoned equal to one ton English, but molasses being heavier, and honey still more so than sugar, it may be safely assumed that the gallon is equal to 12 lb., which gives for

a ton of 2,240 lbs. about 2,700 lbs., leaving thus an over-weight of 400 to 500 lbs. $\frac{1}{2}$ ton, for which no freight is paid, the ton being calculated in gallons as already mentioned.

1106. The *Shipping Gazette* of 17th October, 1866, says—"That on discharging a cargo of Cuba sugar, if a large quantity of drainage, all in good order, is found in the 'tween decks, it is the master's duty to supply labour to scrape it up (supposing the delivery is over side), and the consignee's place to find packages to put the drainage in : if he does not, the master may supply and charge cost of packages.

1107. In relation to the West Indies generally, it is said to be disadvantageous to the ship to charter for sugar in hogsheads. When freights range high it is the practice with some shippers to pack only two-thirds, or it is said one-half, the proper quantity in each cask, and then to blow the hold up with as few hogsheads as possible. When freights are low the casks are filled chock-a-block, and the hold is stowed closely. Sometimes there are 22 cwt. in a hogshead, at others 11 only. Masters would prefer to be paid freight per hogshead, full or not. At Trinidad and some other islands, the freighter can draw say £4 on every hogshead enumerated in the bill of lading ; he therefore seeks in this case to send as many hogsheads on board as possible ; it is not necessary that they should be full in order that he may obtain the stipulated amount on each hogshead. Cases and bags of West India sugars are usually full. An owner chartered his ship for West India produce, calculating that she would obtain sugar and molasses, for which the terms were favourable. She was laden with logwood and thereby made an insufficient return ; nevertheless logwood is the produce of the West Indies.

1108. **Porto Rico.** The brig *Mary Ann*, Capt. J. SIMPSON, of London, loaded here in 1868, sailed 29th April, and arrived at Plymouth 4th June. She registers 225 $\frac{1}{2}$ tons, is 98 feet long, 24 broad, and 14 deep. Her cargo, 415 hogsheads and 53 barrels, filled the ends, but more could have been placed amidships had there been sufficient "small stowage." which was not plentiful ; the dunnage, deal ends, &c., was at least 6 inches thick over all. She drew 12 feet 4 inches aft and 11 feet 8 inches forward ; and lightened 5 inches ; the out-put was 251 tons net. With a dead-weight cargo, 355 tons Newcastle coal, her draught is 13 feet 2 inches aft, 12 feet 10 inches forward ; best draught at sea 13 feet 2 inches and 12 $\frac{1}{2}$ feet. The **season of shipment** at Porto Rico is from 1st March to 30th July ; the chief months being April, May, and June ; the hurricane commences in August, when the premium for insurance is greatly increased. The ordinary loss by drainage is 5 or 6 $\frac{1}{2}$ cent. ; but i

the sugars are very fresh it may reach 11 ¢ cent. At Porto Rico half a dollar ¢ ton is paid for discharging ballast in lighters, the cost of which is heavy. Capt. SIMPSON threw his ballast (70 tons) into the sea between the first loading port, Naguabo, and the second, Arroyo. The **port charges** were as follows :—

		\$	¢
NAGUABO	Customs	225	57
	Anchorage	4	
	Interpreter	8	
	Port Captain	12	
	Doctor's visit	4	80
	Pilot in.....	5	
	Stamped paper (Customs entries in and out)	8	75
	Consul's fees	2	50
	Lighterage 50 hogsheads sugar	18	75
	Consul's fee	4	
ARROYO	Customs and Pilot in and out	28	
	Interpreter's fees and stamp paper	12	
	Anchorage	2	
	Port Captain	22	25
	Lighterage 365 hogsheads 53 barrels ...	189	13
		\$546	75

EXCHANGE @ \$4 80c. American dollars equal to £114.

At San Juan, the principal port, the Consul's fee is 1½ dollars ; at Naguabo, Vice-Consul 2½ dollars ; at Arroyo 4 dollars ; at Aquadilla there is no consular office.

1109. **South America.** Bahia sugars, Pernambucos, Maceios, &c., are in chests 15 to 23 cwt., cases 8 to 10 cwt., and twilled calico bags 1½ cwt. Brazil chest about 10 cwt. Dry vacuum pan sugar shipped at **Demerara** in hogsheads is liable to be damaged if stowed near Muscovado or other wet sugar. Shippers at Demerara usually send the following notice : "Please receive so many hogsheads of dry sugar," &c.—"Dry sugar must be stowed separate from wet, and under no circumstances can we permit Muscovado or wet sugar to be stowed on dry or vacuum pan sugar. If this be disregarded, the master and owners will be held liable for all loss or damage occasioned thereby."

1110. **Surinam.** The brig *Willem Jacobus*, 212 tons Dutch, 185 English, has frequently loaded sugar at Surinam ; each cargo contained 340, 360, or 380 hogsheads, according to their sizes ; no ballast. So laden she drew 12½ feet aft, and 11 forward ; with 276 tons of Sunderland steam coal, 12½ feet aft, and 11½ forward. The brig is 96 feet English long, 23 broad, and 13 deep ; four heights of hogsheads could always be easily stowed. The casks which have wooden

hoops are very weak, and the average loss by leakage is about 10 per cent. The dunnage consisted of pieces of wood about three feet long by six inches thick. The principal season for shipment is during October, November, and December, but when there is a large stock in store, shipments take place all the year round.

1111. At **Pernambuco** 14 bags of 5 arrobas each, 70 arrobas ; 2,240 lbs. go to a ton for freight. The brig *Castor*, Capt. KLOPPENBURG, 100 commercial lasts Oldenburg, 223 tons register, 98.5 feet long, 24 feet 7 inches broad, 11½ feet deep from the under face of the deck beams, took in 4,100 bags of sugar at Pernambuco, in February, 1866, and discharged the same at Plymouth in April following. The bags contained each five arrobas of 32 lbs. Brazilian, or 28 lbs. English ; the in-take cargo weighed 293 tons 17 cwt. Freight ton about 14 bags. Gross weight delivered 5,423 cwt. 3 qrs. 11 lbs. ; net 5,314 cwt. 0 qrs. 3 lbs. With the sugar her draught aft was 12 feet, forward 11½, the same as with 285 tons of Cardiff coal, but she was more lively at sea with the coal than with the sugar, which seemed to increase in solidity daily, and caused the brig to roll excessively. With 4,550 bags of Bahia coffee, each of four arrobas, 256 tons, delivered in London, she drew aft 11 feet 9 inches, and forward 11 feet, and was more lively at sea than with the coal. Her hold could contain more than 4,550 bags, but the merchant would not permit more to go in, for the purpose of securing proper ventilation. The *Castor* was built at Bremen, of oak, and is strongly fastened with stout iron knees, &c. She has an extensive quarter-deck, and a deck-house. The quarter-deck runs forward, beyond the mainmast, being 47 feet long ; it rises 3½ feet above the main deck, and the master's cabin, which is 24 feet long and 13 feet 2 inches broad, rises 3½ feet above the quarter-deck. The deck-house forward for the accommodation of the crew, contains also a cook-house, and a chain-room for the cables. Under the fore part of the quarter-deck on each side, there is a water tank containing 12 hogsheads, access to which is obtained by brass screw stoppers fitted into the deck. It will thus be observed that all the ship's furniture and stores are on the main-deck, notwithstanding which she is sufficiently stiff to be able to shift without ballast. The tanks are covered with a composition consisting of tar two-thirds, and rosin one-third, boiled together and put on hot ; it is like sealing wax, and preserves the wood. The *Castor* is provided with a ventilating hatch just under the cabin steps and another under the top-gallant forecabin. She has also on each side of the waist of the ship, four ventilating pipes up through the covering boards, with brass screw taps which can be raised but not

removed. By these means thorough ventilation of the cargo was obtained, and within ten days after leaving the effluvia from the sugar had almost entirely evaporated. Her pumps are fitted on the quarter-deck, so that the men working them are not interrupted by the accumulation of water. She has also a pipe alongside the pumps by which the pump-well can be easily sounded. This brig has forward of the deck-house two square water casks, each containing two hogsheads, which are fastened to the deck by iron bands screwed together over. The casks are 4 feet 4 inches long and $2\frac{1}{2}$ square. The staves are $1\frac{1}{2}$ inches thick, and are bound together with eight iron hoops $1\frac{1}{2}$ inches wide. These casks occupy less space than round casks and are not so liable to roll in heavy weather. The dimensions of the *Castor*, as measured by the officers of Customs in London are—

		ft. in.		ft. in.		ft. in.	ton.
<i>Hold</i>	Girt ...	46 3	breadth...	24 7	length...	98 8	211'02
<i>Poop</i>	Length	45 2	breadth...	20 0	height...	3 3	29'83
<i>Above Poop</i>	Length	24 0	breadth...	13 2	height...	3 0	9'50

Tons 250'35

1112. At a trial, the *Estelle*, DUCKETT v. SATTERFIELD, Common Pleas, 5th February, 1868, it was stated to be the custom at Pernambuco and Paraiba, to take by the printed table of rates, 29 arrobas of 32 lbs. each of cotton as equivalent to one ton of sugar. The vessel carried about 196 tons cotton, and by the calculation the freight produced would be £834, whereas her capacity for sugar with sufficient bags for broken stowage being 315 tons, would produce £1,338. Mr. SHALDERS, British Vice-consul at Paraiba, states 8th February, 1868, that Capt. E. GARDNER left that port the day before in the brig *Melita*, belonging to Blyth. He was asked to sign bills of lading for his ballast of sugar, 1,000 bags, and about 150 bags of cotton, before 300 bags of sugar were on board, and having refused, his consignor detained the vessel all her 30 lay-days. On the last but one, 25th January, he wanted to put the rest of the cargo, 60 to 80 bags, on board, to prevent demurrage claims, but it was after Customs' hours, and it was impossible to stow the cotton below. It was received on the Monday, and there being insufficient space for eight bags, the master desired to have them landed or else to have the bills of lading endorsed "on deck at shipper's risk." The consignor not only refused this but made an exorbitant charge for pressing the cotton, and for exchange, but this was somewhat rectified by the Judge of Commerce; the eight bags of cotton having been lodged in the custom-house. The mode of conducting business at Paraiba

requires much watchfulness by masters. The consignor wanted the master's signature that he might put the bills of lading in the market at Pernambuco.

1113. **Bahia.** In chests, 70 arrobas of 32 lbs., 2,240 lbs., or 80 arrobas in bags, 2,560 lbs., go to a ton for freight; the difference of weight requires attention. 2,240 lbs. Brazilian = 1,500 English. Bahia chests, from 18 to 25 cwt., are occasionally strengthened with iron bands, for conveyance coastwise. Piassava is much used there for dunnage; it is in bundles 4 feet long and 6 inches thick, weighing about 28 lbs. Three double bundles, 36 inches, compressed by the cargo to 18, are laid on the ceiling from the keelson to above the bilges, and two double bundles up to the 'tween decks, which are battened or cased. Piassava twines like ivy round the trunks of trees; it is an excellent substance for dunnage, not being liable to rot or to become heated; it will not ordinarily retain water, and air circulates freely through it. Piassava sells readily in England for the manufacture of brushes, brooms, &c., and is frequently used as a substitute for horse hair. Good wood dunnage is expensive, it is however better for the flat of the floor than piassava, the compressed bundles of which retain leakage there, and prevent it from running freely to the pumps. Coker-nuts may also be used for dunnage at Bahia, &c., as they generally find a ready market on arrival. In place of mats, palias, the leaves of the cocoa-nut tree, are used; they are procured from some of the small ports to the north, and cost per 100 a little more than one mil, which ranges from 2s. to 2s. 4d.; about five are required for every ton of sugar. A flat-bottomed barque, sharp at both ends, 304 tons register, which could carry easily 440 tons of coal, was capable of stowing 6,000 bags of Pernambuco sugar, with ample space left in the hold. The barque *Moulton*, 372 tons register, Capt. KIDD, of Dumfries, loaded sugar at Bahia, in August, 1862. For dunnage she had 4,519 double bundles of piassava, five of which weighed 44 lbs. They were laid four thick in the bottom, with a little wood between to compensate for the compression; after discharge, this part was found 15 inches thick. The same number of bundles was continued well up to the round of the bilge to prevent contact with leakage, for if a corner or angle of a chest had been wetted, the whole contents would have been damaged. The cargo consisted of 536 cases, averaging 17 cwt. each. So laden she drew fore and aft 16 feet 2 inches; with 570 tons of coal she draws 17½ feet fore and aft. The *Moulton* is 98½ feet long, 19 deep, and 18½ broad. January is considered the best month for the shipment of sugar from Bahia.

1114. **Bahia Charter-party and Sugar.** Vessels sailing for the Brazils are often freighted for the voyage out and home, for which the freight is usually paid after the discharge of the return cargo. The charter-party should be examined carefully (particularly if the vessel be destined for Bahia) as it generally contains: "*freight will be paid (£3 10s. or £4) per nett ton of sugar in cases, delivered weight, other goods in proportion, according to Bahia Table Rate.*" According to this rate, the ship is always the loser, as a vessel actually taking 300 tons of heavy goods receives freight from Bahia only on 250 tons. The Bahia Table Rate being always to the disadvantage of the ship, owners are advised to get all the information possible about the port for which their ships may be chartered. Captains receiving cargo in Bahia should take care to have inserted in the charter-party "Brazilian products," else they may be sure to receive a cargo of palm oil. Cedar wood in blocks is not yet fixed in the tariff. The first shipment of it was made by the *Margareth*, and received at 50 cubic feet per ton.

1115. **Mauritius.** The dunnage, which is small brushwood, should be continued right up the sides, to take off any leakage from the decks, chain-plates, or sides, as continual dropping only of salt water will ruin an entire bag, which in turn destroys others. All leakages not only injure and waste sugars, but make them weigh heavier, which is of serious consequence when passing through the custom-house scales. When cargo is allowed to lie on the decks in the sun previous to going into the hold, the pitch from the seams will greatly injure it. Capt. SEDGWICK recommends that where there are 'tween decks a few planks should be removed amidships, for if heavy weather is encountered, and the cargo in the hold is washed, that in the 'tween decks will fall through and prevent the ship from foundering. A tierce weighs 7 to 9 cwt., but it is usually shipped in mats or vaca bags, averaging 1·36 cwt. gross; the finer sorts in double vaca bags, the coarser in gunny bags inside vaca bags; tares, ordinarily, $3\frac{1}{2}$ to 4 $\frac{1}{2}$ cent. Mauritius sugars occupy more space than Calcuttas; the best **shipping season** is from September to April. [Rats commit great depredations from cargoes of sugar in the Mauritius; see the article vermin.]

1116. The barque *Jone*, of Sunderland, built on the Weir in 1861, 364 tons register, took in 8,306 bags of sugar in December, 1862, which weighed net at Mauritius 572 tons and 9 lbs. The bags, mat and gunny, contained on an average 160 lbs. gross. The dunnage, wood, was 15 inches thick on the floor, 18 in the bilges, and two inches against the sides, all the way up. The *Jone* is a large

carrying ship and loads a little by the head. The sugar being heavy, space remained for about 600 bags, of which 300 could have been placed forward, and the remainder close up to the deck, from amidships fore and aft. So laden (that is without the 600 additional bags) she drew 16½ feet aft, and 15½ forward, or 16 feet on a keel, the same as in June, 1862, when she took in 602 tons of Aberavon steam coal at Cardiff, which weighed out 508 tons only at Monte Video. The *Jone* is 119 feet long, 27 feet beam, and has 17 feet depth of hold, with about six feet height between decks; she sails well. During the passage from Mauritius the sugar steamed considerably, turning the white paint in the cabins to a lead colour, and where there had been water, black. The usual quantity shipped per day is from 1,000 to 1,800 bags, but more can be shipped if necessary. It is sent alongside in lighters carrying from 400 to 800 bags each. Capt. THIRKELL says: "Mauritius is an excellent place for dispatch; it is a port easy of access, but liable to be visited by hurricanes, which extend from November to March." Small vessels such as the *Jone* are moored to buoys laid down for the purpose; larger ships are moored with four anchors. Her **port charges** during a stay of 19 days amounted to £32 10s. Ships are supplied with water by tanks (there are one or two steam tanks), or if preferred, they can fill up with water in casks free of expense; the charge from the tanks is 3s. 6d. per ton. Beef brought from Madagascar in regular bullock traders, 6d. per pound. Sheep (and horses) are mostly imported from the Cape; mules are sometimes brought from the River Plate, but never on freight. There are two or three graving docks capable of taking in large ships. The *Ravenscraig* (see linseed), with 11,017 bags of Mauritius refined crystallized sugar, drew 19 feet 2 inches aft, and 18 feet 9 inches forward.

1117. **East India.**—Colonial. Entire cargoes are frequently dunnaged with sapan wood and bamboos. Quantities (in bags of 160 lbs. each, or two maunds,) are shipped in December at Calcutta, where 20 cwt are estimated to occupy 39 cubic feet, but this depends upon the nature of the packages. Calcutta sugars occupy less space than Mauritius, and much less than Batavia. Dobah sugar, shipped at Calcutta in bags, is perfectly dry, and there is not much tare. In the lower hold, stow right up to the beams, and use a sufficiency of hides (which should be previously engaged, even at a decreased freight) between the beams, and fill well above them. Cross the hides skilfully with bags of sugar, and the beams will be secured from unfair pressure. Hides need not be used in the square of the main hatch, for being in the middle of the ship, it is desirable to

place as much weight there, comparatively, as possible. The lower part is frequently trodden on in loading, and is, therefore, tolerably solid; if, however, there is any settlement, it must be right down on the sugar. Saltpetre in bags, if not packed separately, should be put under sugar; its specific gravity is greater, and it is liable to less injury from sugar than sugar is from saltpetre; nevertheless, sugar will alter the colour of saltpetre, and it is better for both that they should not be stowed together. Some masters recommend a break of cowrie shells in bags, right athwart the hold, in the wake of the pump-casing, and to put the sugar one side and the saltpetre the other. East India sugars are liable to injury from indigo, which see. A bag of East India sugar weighs from one to two cwt.; a bazaar maund at Calcutta 84 lbs.; two maunds, 168 lbs., make a bag, and 13 bags go to a ton for freight. Penangs are in double grass mats half to three-quarters cwt. Madras, in gunny bags, 1½ to 2½ cwt. each. The loss on ordinary Madras sugar is 12 ½ cent. on delivery in England. E.I. Co.'s ton for freight 20 cwt. in bags.

1118. **Jaggery.** The term is applied derisively to higher-class sugars in a low condition; it is also applied by some to all common East India sugars. Jaggery is a very dirty kind of sugar, said to be extracted from the toddy or palm tree, and is produced plentifully between Madras and False Point on the Coromandel Coast, on the west side of the Bay of Bengal. The **new crop** is usually ready for shipment at Bimlipatam in some part of the month of February. 20 cwt. go a ton for freight. It is always taken for dead-weight, stowed in the bottom. When new from the factory it is in hard lumps, but after exposure to heat it becomes soft, and in a ship's hold treacle runs from it to the pump-well. 4,114 bags jaggery, gathered in February, 1863, on an estate 30 miles from Bimlipatam, were shipped there in February and March, on board the barque *Cheviot*, Capt. J. H. HENDERSON. This jaggery was packed in double gunny bags, each containing 163 lbs. Some of the upper tier became soft, like a jelly, in consequence of being trodden on by the crew. When discharged, the trodden portion had become very hard. All had hardened to a certain extent. The in-take quantity weighed 298 tons 11 cwt.; net delivered in London 265, showing a loss of about 11 ½ cent. The *Cheviot* is 501 tons, and belongs to Messrs. T. and W. SMITH, London. She left Madras 2nd June, 1864, when her cargo consisted of —

300	Tons sugar and jaggery,	15	Bales hides, [and deerskins,
1,329	Bales cotton,	294	Bales tanned goat, sheep,
112	Chests indigo,	12	Tons redwood.

A strong sea was running at Madras, so that her draught could not be taken correctly. On arrival in London in September, she drew 16 feet aft and 14 feet 11 inches forward.

	aft.	forward.		aft.	forward.
With 282 tons	12 ft. 5 in.	12 ft. 5 in.	With 500 tons	14 ft. 9 in.	15 ft. 0 in.
313 tons	12 8	12 8	582 tons	15 10	15 10
342 tons	12 11	13 0	623 tons	16 0	16 7
401 tons	12 4	15 0	651 tons	16 8	16 7
447 tons	13 10	14 10			

The above notes were made when the *Cheviot* loaded at Cocanada, where the water is smooth. With the cargo loaded at Madras the jaggery was placed in the bottom, and the sugar over, so as to trim the ship; a mat was placed between. Then deal boards or any thin dunnage, double matted, to receive bales of cotton or bales of skins, indigo, or other dry goods. She was dunnaged in the bottom and bilges with redwood, and in the sides with small-size bamboo. Eight bales of the cotton shipped at Madras, 10th May, 1864, measured there 92.96 cubic feet = 1.86 tons nearly, at 50 cubic feet per ton. Having on board 223 tons of jaggery, 12 of redwood, 7 of coal, 3 of beef, &c., 4 of dunnage, and 6 tons of ballast, in all 255 tons, the *Cheviot* drew 12 feet fore and aft. A cargo of jaggery with nothing between the tiers, ran together and was got out with considerable difficulty on discharge; another cargo with greased boards between, came out with comparative freedom.

1119. **Gurpattah** is a term used to indicate the *best* of the sugar from the date palm; say about three out of the six grades, the lower being boiled over again, or used in the country. Although clean in flavour, gurpattah sugar has not much quality or strength. It is exported chiefly from Calcutta in double bags (weighing about 8 lbs.), the average gross weight being $1\frac{3}{4}$ to 2 cwt.; and **principal season** of export March to August.

1120. **East India**—Foreign. Chinese sugar in casks is entitled to increased freight. Manilla is shipped in bags or bundles; when in hogsheads or boxes the drainage and tares are great. In single grass mats the weight is generally half to three-quarters cwt. each; they often come to hand in bad condition. Much waste of unclayed Manilla sugar takes place at sea; it is stated that one-tenth at least is pumped out during the passage to England. At Manilla, when hemp and other light cargo is freighted at \$12 per ton of 40 feet, sugars rate at \$10 per ton 20 cwt.; sugars are often freighted by the picul, 132 lbs. Javas are packed in baskets, 3 to 6 cwt., which when empty weigh from 20 to 30 lbs. each. The dunnage at Java, &c., is

2 R

canes, which are used for manufacturing chair seats. At Batavia and some other ports, sugar is shipped in baskets or canisters; they occupy more space by 30 $\frac{1}{2}$ cent. than if in bags. Batavia sugars occupy more space than those from Calcutta and Mauritius; see the article Netherlands, for sugars from Batavia, Charibon, and Tagal, page 435.

1121. **Zebu.** The *Sir W. F. Williams*, Capt. E. WILSON, belonging to Messrs. SHAW and Co., of Cophall Court, London, loaded at Zebu, one of the Phillipine Islands, 10th April, and arrived in London, 8th August, 1865. She was the fourth ship which had loaded there—the second for Europe. Her cargo consisted of 400 tons sugar, 84 bags shells, 50 bags coffee, 32 cases specimens natural history, 4,683 bales hemp, 201 bales hides, and one case gutta percha. This ship registers 869 tons, is 181·1 feet long, 34·5 broad, 26·8 deep, and has a height of 'tween decks of 8 feet. So laden she drew 19 $\frac{1}{2}$ feet aft, 18 $\frac{1}{2}$ feet forward, and on arrival 19 feet 4 inches and 18 feet 4 inches; her best trim is 19 and 18. About 40 tons of stone ballast was covered with bamboo canes and mats; dunnage, bottom 14 inches, bilges 18, sides 2 $\frac{1}{2}$. The sugar was not sufficient to stiffen the ship without the stone. By the custom of the port, 80 feet or 20 cwt. of hemp go to a ton for freight; it came principally from Mindano, Zebu being the nearest port; the bales measured about 10 cubic feet, and weighed 2 $\frac{1}{2}$ cwt. The bags of sugar weighed from 56 to 112 lbs.; of coffee 28 lbs.; the hides were very small, the cattle being less than those from Alderney. Masters should obtain passports from the Spanish consul at the port of clearance, or they will be fined \$200 at Zebu. **Port charges** of the *Sir W. F. Williams* were inwards *nil* (in ballast); outwards £83; **pilotage** in £10, out £10. The **season for shipment** of sugar is from October to August. Showers are not frequent, and when they fall are quickly absorbed by the soil which in some parts is composed of sand and stone. Fresh-water can be obtained only from half ebb to half flood; at high tide the well is overflowed. The water is plentiful and very passable; it is got off by rafting the casks.

1122. The island of Zebu or Cebu is separated on the west from the island of Negros by the Straits of Tanon, and has on the east the dependent isles of Matan and Bohol, between lat. 9° 20' and 11° N., and lon. 123° and 124° E. It stretches N.N.E. and S.S.W., and forms a comparatively long and narrow belt; its fertile valleys yield rice, sugar, cotton, tobacco, and the best cacao, and its pastures feed cattle. Breezes in the morning and evening temper the heat. The town is nearly in the centre of the eastern shore, opposite

Matan ; it is divided by a stream ; one side is occupied entirely by Mestizas, half castes, who have a small fort, many large stone houses, a cathedral, &c. ; population with pueblo 8,805. The depth of water varies from seven to 10 fathoms ; the anchorage is not very secure, unless close to the fort, which part is generally occupied by government ships, but as merchant vessels are moored the risk is not great. The wharf is used for passengers only ; fish are plentiful ; on the island 30 mile south of the port, coal is obtained, and is sent thence in small vessels to Manilla. The province, which include the islands of Matan, Bantayan, Sicijon, Bohol, and Tamotes, with 41 pueblos or townships, has a population of 256,803. That of the Phillipines is 5,000,000 ; there are 1,200 islands which cover an area of 120,000 square miles, and are controlled by the governor-general at Manilla. On the western part of the Phillipines it rains from June to September ; in October the wind transfers the rain to the eastern parts.

By the customs of the port at **Zebu**, 80 feet or 20 cwt. of hemp go to a ton for freight, a bale measuring 10 cubic feet and weighing $2\frac{1}{2}$ cwt. Bags of sugar weigh from 56 to 112 lbs. ; coffee 28 lbs.

1123. **Phillipine Isles.** The barque *Lily of Devon*, 308 tons, Capt. R. H. LUXTON, belonging to Mr. W. F. MOORE, Plymouth, loaded sugar at Ilo Ilo (one of the Phillipine Isles) in 1869. She is 134 feet long on deck, 27 broad, and 17 feet deep. The **dunnage**, bamboos covered with bamboo mats, was two feet six inches in the bottom, carried well up the bilges, and three inches in the sides. The sugar was in mat bags, averaging about 80 lbs. each, tare one to two pounds ; they were carried right up to the main hatchway, sloping off forward, where there was considerable space left, and aft, with little space to meet the build of the ship and keep her in trim. She sailed 25th March, and on putting into Plymouth for orders 6th September, there was a settlement of the cargo of three feet, owing partly to drainage, but chiefly to compression. On departure her draught was aft 17 feet 7 inches, forward 16 feet 6 inches her best trim at sea ; with 613 tons of coal, 16 feet and 17 feet, when *in dock* at Cardiff. **Port charges** in and out of Ilo Ilo, 25 cents \pounds ton (Customs part of which was probably repaid). **Pilotage** in and out \$14. The **season of shipment** of sugar extends from October to August, but the chief months are March, April, and May.

The intake of the *Lily of Devon*, was 629 $\frac{1}{2}$ tons net ; the out-put 599 $\frac{1}{2}$. There was thus five \pounds cent. loss by drainage, evaporation, waste, &c. The tare, as accepted by the Custom-house authorities, was 3 lbs. \pounds bag on 410, 2 lbs. \pounds bag on 28,389 bags, and 5 lbs. on each of the baskets.

The delivery at the Albert Dock, Liverpool, was as follows :—

	GROSS.			TARE.			NET.		
	cwt.	qr.	lbs.	cwt.	qr.	lbs.	cwt.	qr.	lbs.
Sugar, 28,799 bags...	11941	2	15	517	3	20	11423	2	23
595 baskets	595	3	11	26	2	2	569	1	9
Sweepings	8	0	8	4	0	19	3	3	17
	12545	2	6	548	2	13	11996	3	21

The delivery in London, in October, 1869, of the barque *Channel Queen*, belonging to Messrs. DE PUTRON, ROTH, and Co., also from Ilo Ilo, was as follows :—

	cwt.	qrs.	lbs.
Sugar	18,490	2	13
Tare	428	2	48
Net delivered	18,061	3	23
Sapan wood.....	268 cwt.		

The net weight of the sugar shipped was 913 tons. The loss by drainage, &c., was therefore little over one $\frac{1}{2}$ cent. The smallness of the loss was caused by the very good quality of the sugar. In some places like Taal (according to this authority), the loss varies from 15 to 20 $\frac{1}{2}$ cent., and from Zebu 10 to 12 $\frac{1}{2}$ cent. (stated roughly), for if the season has been more rainy than usual whilst the cane was growing or grinding, the loss will be more or less great. The *Channel Queen* is 167·8 feet long, 30·6 broad, and 17 deep; she registers 610 tons, out of which the poop measures 55, leaving 555 tons for sugar cargo. She carried 937 tons gross weight of sugar and sapan wood.

1124. **India.** To squeeze the juice from the canes, in several parts of India, two small wooden rollers close to each other are employed. Another form of sugar mill is on the principle of a mortar and pestle. The pestle is rubbed against the canes (cut into slices beforehand)—a troublesome operation—the moving force is two oxen: the pressure is so imperfect that a large amount of juice is left, thus causing a loss at the very outset. The juice is boiled in pans heated over an oven fire, and is made into *goor* by the poor cultivators. This *goor* is purchased by persons whose business it is to remove impurities from it, and produce sugars of various qualities, known by the names of Khur, Doolo, Gurrattah, and Doborah. *Khur*

sugar is made in Bengal by pouring goor into coarse gunny bags, and pressing between bamboos lashed together, until 30 to 40 $\frac{1}{2}$ cent. of it is forced out in the shape of molasses, or sugar that will not crystallize; the residue is khur. *Ninsphool* or fine khur is made by repeating the above process, which causes a further portion to be separated. *Doolo* or *Dulloah* is made by pouring goor into open baskets, holding two or three mounds each, three inches of wet grass being placed over the goor, the molasses drain through a hole into a vessel placed underneath. As soon as the grass is dry, the upper part, deprived of the molasses by draining, is scraped off with a knife to the depth of two or three inches, and fresh grass applied. When dry, a fresh portion of sugar is scraped off, and this process is repeated till the basket of goor is emptied. The scraped-off sugar is placed on mats in the sun to dry. When well made, doolo is dry, light, and sand coloured. Puckha chuna, or gurpattah, is the refined sugar of India; it is made by boiling khur with potash temper, which removes the impurities; after skimming it is filtered through a cotton cloth and boiled, then poured into earthen pots, and as it cools it forms crystals of white sugar. The syrup which drains from the pots is boiled with fresh goor, and an inferior sugar is produced called jerannee. Gurpattah sugar is bright, clean, and dry, and keeps well. Doborah is of superior quality to gurpattah, being a good white, dry and well crystallized sugar, and is made from doolo instead of khur. It resembles the crushed refined sugar of European manufacture.

1125. In the north-west provinces of India the sugar cane is usually planted in March. The tare on China sugar at San Francisco is 4 lbs. for each mat containing four pockets of 25 lbs. each. The white clayed sugars of Java are usually packed in "kranjangs" of about 140 lbs. each.

Tonnage. 20 hogsheads, averaging $16\frac{1}{2}$ cwt. each, equal to $16\frac{1}{2}$ tons, occupy 850 cubic feet or 1 keel. 22 hogsheads, each 41 inches long, 47 inches bilge, and 40 inches head diameter, admeasure 850 cubic feet. Bengal, Madras, and Bombay ton 20 cwt. in bags; Calcutta 39 feet: Mauritius 14 or 15 bags; Bahia 20 cwt. in cases, boxes, or barrels, and 23 cwt. in bags; New York 20 cwt.; Baltimore 2,240 lbs. net in casks. At Lisbon, a last for freight is computed at 4 chests. When wheat is 1s. $\frac{3}{4}$ quarter, sugar is rated at 5s. $10\frac{1}{2}$ d. $\frac{3}{4}$ ton. An Admiralty barrel weighs 392 lbs. net, half-hogshead 280 lbs., a kilderkin 168 lbs. and small cask 112 and 140 lbs. A Brazil arroba of brown sugar usually renders from 27 to 28 lbs. Hamburg weight; white sugar $27\frac{1}{2}$ to $28\frac{1}{2}$ lbs.; Havana $21\frac{1}{2}$ to 22 lbs.

112 lbs.	English equal to	105 lbs.	Hamburg,
110 lbs.	— —	101 lbs.	Spanish,
108 lbs.	— —	100 lbs.	French.

SUGAR TARES AT HAMBURG.

DRAFT, ONE PER CENT.	Havana, white, fine	PER BOX.
	— middle and yellow	White 65 lbs.
	— yellow	Brown 70 lbs.
	— brown	
	Bahia, in cases, white fine	
	— — — middle	In cases, white 16 $\frac{7}{8}$ cent.
	— — — and low	— brown 18 —
	— — — brown	
	— in bags —	In bags 12 —
	Pernambuco, in cases, white and fine ...	
	— — — middle and low...	In casks..... 14 —
	— in bags, white	
	— — — brown	
	Java, yellow and white	In baskets..... 12 —
	— brown	
	East India and China, white and yellow	
	— — — brown	
	Mauritius, yellow and gray	In bags 5 —
	— brown	
	Manilla	

SEASONS AND CHIEF MONTHS OF SHIPMENT, SIZES AND WEIGHTS OF PACKAGES, &c.**WEST INDIES.—BRITISH.**

Jamaica. Hogshead 18 cwt., tierce 12 cwt., barrel 2 cwt. ; season of shipment February to August ; chief months of shipment April to June.

Trinidad. Hogsheads large, truss 40 to 42 inches ; season of shipment March to end of August ; chief months of shipment May to July.

Barbadoes. Hogshead 17 cwt., tierce 10 cwt., bags 2 cwt. ; season of shipment March to end of August ; chief months of shipment April to August.

Antigua and Tobago. Hogshead 16 cwt., tierce 10 cwt., barrel 2 cwt. ; season of shipment March to end of August ; chief months of shipment April to August.

Dominica. Various casks ; season of shipment March to end of August ; chief months of shipment January to August.

Grenada. Hogshead 16 cwt., tierce 10 cwt., barrel 2 cwt. ; season of shipment March to end of August ; chief months of shipment January to August.

St. Vincent. Hogshead rather small, usually well filled ; season of shipment March to end of August ; chief months of shipment January to September.

St. Lucia. Hogshead 14 cwt., tierce 8 cwt., barrel 2 cwt. ; season of shipment March to end of August ; chief months of shipment January to September.

St. Kitts and Nevis. Hogshead 15 cwt., tierce 8 cwt., barrel 2 cwt.; season of shipment March to end of August; chief months of shipment January to August.

FRENCH.

Martinique. Hogshead 14 cwt., tierce 7 cwt., barrel 2 cwt.; season of shipment March to end of August.

Guadeloupe. Hogshead 14 cwt., barrel 2 cwt.; season of shipment March to end of August.

SPANISH.

Cuba. Season of shipment December to August; chief months of shipment April to September.

Havannah. Hogshead 1,300 lbs.; five boxes about a ton; season of shipment December to August.

Matanzas. Hogshead 12 cwt., tierce 8 cwt., barrel 2 cwt., box 4 cwt.; season of shipment 1st March to 31st July.

Porto Rico. Shipped in hogsheads and barrels; season of shipment 1st March to 31st July; chief months of shipment May and June.

SOUTH AMERICA.—BRITISH.

Demerara. Hogshead large, truss 40 to 42 inches; season of shipment nearly all the year; chief months of shipment December to March.

Berbice. Hogshead 18 cwt., tierce 12 cwt., barrels and bags 2 cwt.; season of shipment nearly all the year.

DUTCH.

Surinam. Shipped in hogsheads; season of shipment nearly all the year; chief months of shipment October to December.

BRAZILIAN.

Bahia, Maceio, Maroim, Pernambuco. Chests 15 to 23 cwt., cases 8 to 10 cwt., and twilled calico bags $1\frac{1}{2}$ cwt.; season of shipment October to May; chief months of shipment January to March.

Paraiba. Bags $1\frac{1}{2}$ cwt. season of shipment November to March; chief months of shipment January and February.

EAST INDIES.—BRITISH.

Penang. Double grass mats $\frac{1}{2}$ to $\frac{3}{4}$ cwt.; season of shipment October to March; chief months of shipment December to February.

Bengal, cane, date. Low, mats and bags 1 to 2 cwt., 20 cwt. 39 cubic feet; season of shipment October to January; chief months of shipment December to February. *Gurpallah,* bags $1\frac{1}{2}$ to 2 cwt.; season of shipment March to August.

Dobah. Manufactory closed.

Cossipore, Benares. Bags $1\frac{1}{2}$ cwt.; season of shipment March to August; chief months of shipment December to February.

Madras. Low, mats and gunny bays $1\frac{1}{2}$ to $2\frac{1}{2}$ cwt.; chief months of shipment December to February.

Bimlipatam. Double gunnies 163 lbs. ; season of shipment February to —
Singapore. Double mats 115 lbs. gross, 112 net ; season of shipment January to September.

Mauritius. Tierce 7 to 9 cwt. ; mats or vacas 136 cwt. gross ; season of shipment October to March.

Port Natal. Large bags 1½ to 2 cwt. ; season of shipment November to February.

FOREIGN.

China, Siam. Bags about 1 cwt. ; season of shipment October to March.

Manilla. Shipped in bags, bundles, hogsheads, boxes ; *unclayed*, in mats and bags.

Phillipine Islands. Bags 56 to 112 lbs. ; season of shipment October to August

DUTCH.

Batavia. Baskets 5 to 6 cwt., and in canisters ; seasons of shipment nearly all the year.

Java, Sourabaya. Baskets 3 to 6 cwt., tare 20 to 30 lbs. ; season of shipment nearly all the year.

FRENCH.

Bourbon. Bags about 1½ cwt. ; season of shipment September to April.

Sandwich Islands. Bags and barrels 2 to 4 cwt., chiefly shipped to West Coast of North America.

EUROPE.

France. Thin hempen bags 2 cwt., tare 3 lbs. ; season of shipment October to March ; chief months of shipment November to January.

Germany. Casks about 2 cwt., tare actual ; season of shipment October to March ; chief months of shipment November to January.

Holland. Casks about 10 cwt. ; season of shipment October to March ; chief months of shipment November to January.

Belgium. Thin hempen bags 2 cwt., tare 3 lbs. ; season of shipment October to March ; chief months of shipment November to January.

1126. SUGAR CANDY should be stowed in the fore or after hold, clear of all other goods ; this is the rule in all Bombay ships which carry more of that description of cargo than any other ; there is about five per cent. loss on the passage from China to Bombay. If the sugar candy is new and the tubs also, many will be empty on delivery. It is made up in Holland in boxes of 25 and 50 lbs. each ; the wood is so thin that when passing under the line, for the Cape of Good Hope, leakage ensues and frequently injures woollen and other goods. Merchants recommend the candy to be stowed under such goods. Tubs of liche or Chinese sugar candy, measure three cubic feet, and 16½ go to a ton.

1127. SULPHATE OF SODA. Sometimes the article is weighed into carts at a distance from the ship, and then capsized on

board, raising a perfect cloud of dust. At port of discharge it may be put into lighters, conveyed a mile, and then weighed. Being of the nature of flour, immense quantities are thus lost both ways. In the spring of 1864, there was an alleged deficiency of 6 tons 17 cwt. in a cargo of 251½ tons so laden and discharged. A claim of £3 ½ ton was made on the master, but he resisted it, being able to prove that the ship delivered all she received.

1128. SULPHUR; specific gravity 2.033. No ship can carry her full stowage in bulk, say a little over three-fourths; it is not desirable to employ vessels with conical holds in this trade, as sulphur has a tendency by its own weight, to wedge itself down when working at sea, and thus strain the ship. A ship laden with sulphur carries on an average four to eight ½ cent. more than if with coal; but if the burthen in keels be known, and compared with the quantity of sulphur, the exact difference may be found, thus; by dividing the quantity delivered by 424 cwt., so many keels of sulphur are obtained, which multiplied by 97 quarters, less the difference of so much ½ cent. will give the exact burthen in quarters. Sulphur is brimstone in its raw state; see brimstone; see also saltpetre. At Ancona, "wrought" sulphur is packed in chests 3 feet 2 inches long by 14 inches broad, containing on an average 3 cwt.; of these a full cargo cannot be taken, say 175 tons by a schooner 108 tons register, *n.m.*, which could carry 185 tons coal. Her sulphur was admidships; the ends nearly clear. Scarcely any dunnage was used, as the article was not supposed to be liable to much injury by salt-water; the cases were wedged to keep them from working, and stowed right up to the decks. This was brought in 1858, in lighters from the coast to Ancona.

1129. SUPERPHOSPHATE (manure). The vapour is very injurious to tea, coffee, cocoa, &c., and by contact with hemp and similar materials, spontaneous combustion may be created; see manures.

1130. SURVEY. By the Merchant Seamen's Act 1873-5, the Board of Trade have the power to survey ships, and if found overladen or otherwise unseaworthy can detain them; see the article protest. After a voyage, while the ship is in dry dock, surveyors, both LLOYD's and Government, usually inspect her. If it has not been done already, the keelson should be cleared fore and aft, allowing a passage on each side, the ends of the ship should be cleared also, and all dirt and damp scraped, and swept from the bow and stern timbers, breast-hooks, knees, transoms, and ports,

the beams, stringers, shelf-pieces, and ship's skin. If there is time, a coat coat of varnish and turps over the skin, &c., would be beneficial, as it hardens the wood and keeps the damp out. Every limber board fore and aft should come off, but those especially next the pumps, before and abaft; if the bottom of the chain locker is not sufficiently high to permit those in its vicinity being taken off, so that a man may crawl under to clear the limbers, it ought to be so fitted, for the cargo must suffer when there is an imperfect waterway to the punps. Clearing the limbers and placing the limber-boards on again should be attended to by the chief and second officers, and the carpenter; they should see that a piece of hoop or cane is passed through under every floor timber, and that all the dirt is taken out. The foot of the pump should be examined by the hand, and the hand-lead lowered down, so that a person may feel the lead. A pump has been disabled through a quoin getting jammed in it. Some contend that any chief mate who does not himself see the limbers cleared neglects his duty. When the limber boards are put on they should be carefully examined, to see that they are tight; if there are any holes the carpenter should let in pieces of wood, or clinch with oakum; the skin must also be looked to and served in a similar manner, if required, then, whatever cargo the ship may take, there will be no chance of the pumps being choked. When any vessel is shifted in dry dock, care must be taken to have equal portions on each side, so that she may be upright. When coppering, there may be occasion to weigh and take account of the copper and nails received; the old copper and nails should be secured, also the surplus, which will have to be returned; the nails should be picked up from the bottom of the dock, as the value is nearly a shilling a pound.

1131. SWEATING BOXES. To prevent injury from the steam or, as it is popularly called, the "sweat" which is generated inside iron ships, the ends of the beams and the knees are sometimes fitted with wood casings called sweating boxes. Steam from under the deck and from the stringers often runs to the beams, the blobs of which form a water-course for the liquid, until it overflows perhaps on some perishable goods. These beams should be well dunnaged. Bags in good condition containing ginger shipped at Calcutta, and placed close to an iron bulkhead, were rotten on arrival in London, owing entirely to the steam generated on the passage home. For more information regarding iron ships and their cargoes, see the article iron ships.

1132. TALC. A species of fossil nearly allied to mica. Bengal, Madras, and Bombay ton 20 cwt.

1133. TALLOW in casks is allowed to stow six heights; it should be stowed low for the sake of coolness; the casks should always be treated as if they contained wet goods, and never stowed near oats or other heat-producing goods; specific gravity 1.941. In the River Plate, tallow in pipes is ordinarily stowed as a ground tier, and receives a layer of bones or horns on which hides are placed; for England it is usually packed in wine pipes and half pipes, and sometimes in boxes containing $2\frac{1}{2}$ cwt. each. Tallow casks readily absorb salt-water, which will soon rot the wooden hoops used in St. Petersburg; they are sometimes not strong enough to hold together until the ship is discharged, and when striking out cargo, will fly off and leave the tallow unsupported; the crowbar should be used with caution. In the Sea of Azof it is shipped principally in the spring, and never in the middle of the summer, because then the tallow runs from the casks. Masters, in order to obtain more freight, usually load some casks of tallow upon deck; but this should be avoided, because through the heat of the sun the tallow loses considerably both in weight and quality. Casks of white tallow are singular, their form being conical, and their diameter at one end about $2\frac{1}{2}$ feet, and at the other only $1\frac{1}{2}$ feet. To calculate the tare on tallow it is removed from a certain number of casks, which are weighed, and an average tare is thence deducted for the whole lot. A cask weighs $8\frac{1}{2}$, 9, 10, or 11 ϕ cent., but the average is generally about 10 ϕ cent. of the entire weight of tallow and cask. Mare's grease is used in the manufacture of soap; it is almost like oil; in South America it is packed in square cases lined with zinc, or in tarred pipes, the hoops of which are nailed; it is not considered a desirable cargo; it is sometimes in casks which cause the ship to rot; there is also a great loss in the weight. It should be stipulated in the charter-party that if the loss in weight does not exceed 5 ϕ cent. the reduction of freight should be 5 ϕ cent. only; see hides. The Italian brig *Cogoletta*, 223 tons register, loaded at Fray Bentos in the **River Uruguay**, the cargo following, which filled the hold on departure, but subsided considerably on the passage home.

	Tons. cwt. qr. lbs.			
Tallow, 240 pipes, 20 half-pipes	115	15	1	25
Hides, wet, salted, 5,500	160	16	2	23
Bones	22	13	0	0
Salt	11	0	0	0
	310	5	0	20

**PROPORTIONATE FREIGHT TABLE for TALLOW and WHEAT
NEAN TO THE UNITED KINGDOM AND**

Per ton tallow, U. K.		Per quarter, U. K.		Per Odessa last.		Per Dutch last.		Per charge with 5 per cent. for Marseilles.		
s.	d.	s.	d.	flor.	cents.	flor.	cents.	fran.	cents.	m.
1	0	0	0'15	1	00	0	95	0	10	52
5	0	0	9'27	5	02	4	76	0	52	60
10	0	1	6'55	10	04	9	53	1	05	20
15	0	2	3'83	15	06	14	29	1	57	80
20	0	3	1'11	20	08	19	06	2	10	40
25	0	3	10'39	25	10	23	82	2	63	0
30	0	4	7'67	30	12	28	59	3	15	60
35	0	5	4'94	35	14	33	35	3	68	20
37	6	5	9'58	37	65	35	73	3	94	50
40	0	6	2'22	40	16	38	12	4	20	80
42	6	6	6'86	42	67	40	50	4	47	10
45	0	6	11'50	45	18	42	88	4	73	40
47	6	7	4'14	47	66	45	26	4	99	70
50	0	7	8'78	50	20	47	65	5	26	0
52	6	8	1'42	52	71	50	03	5	52	30
55	0	8	6'06	55	22	52	41	5	78	60
57	6	8	10'70	57	73	54	79	6	04	90
60	0	9	3'34	60	24	57	18	6	31	20
62	6	9	7'97	62	75	59	56	6	57	50
65	0	10	0'61	65	26	61	94	6	83	80
67	6	10	5'25	67	77	64	32	7	10	10
70	0	10	9'89	70	28	66	71	7	36	40
72	6	11	2'53	72	79	69	09	7	62	70
75	0	11	7'17	75	30	71	47	7	89	0
77	6	11	11'81	77	81	73	85	8	15	30
80	0	12	4'45	80	32	76	24	8	41	60
82	6	12	9'09	82	83	78	62	8	67	90
85	0	13	1'73	85	34	81	00	8	94	20
87	6	13	6'37	87	85	83	38	9	20	50
90	0	13	11'01	90	36	85	77	9	46	80
92	6	14	3'64	92	87	88	15	9	73	10
95	0	14	8'28	95	38	90	52	9	99	40
97	6	15	0'92	97	89	92	90	10	25	70
100	0	15	5'56	100	60	95	30	10	52	0

1134. **Deck Cargo.** Court of Common Pleas, 8th July, 1863, before Lord Chief Justice ERLE and a special jury. *CORRY v. ROBINSON*. Plaintiff was a merchant and shipowner of New Broad Street, and defendant was owner of a line of steamers. A quantity of tallow had been shipped by plaintiff at St. Petersburg in October, 1861, on board a vessel, the *Eva*, belonging to defendant. On the passage she took the ground on the coast of Sweden, and it became necessary to throw overboard some of the tallow stowed on deck. The tallow was subsequently recovered, and plaintiff now brought this action to recover the amount paid for salvage. Plaintiff alleged that defendant had given him what is called a clean bill of lading, and no notice as to a portion of the tallow being on deck. Defendant contended that there was a particular usage in the trade by which it was customary to stow a portion of the cargo on deck, and that ships were

**OF INDIAN CORN, FROM THE BLACK SEA AND MEDITERRA-
THE PORTS IN EUROPE.**

Per stago, with 5 per cent. for Trieste.			Per sac, with 5 per cent. for Leghorn.		Per mine, with 5 per cent. for Genoa.		Per kilo, with 5 per cent. for Constantinople.		
flor.	kreu.	cents.	sol flor.	cents.	r nuo.	cts. m.	pias.	par.	cents.
o	1	30	1	15	o	7 36	o	3	98
o	6	50	5	75	o	36 80	o	19	90
o	13	o	11	50	o	73 60	o	39	80
o	19	50	17	25	1	10 40	1	19	70
o	27	o	23	o	1	47 20	1	39	60
o	33	50	28	75	1	84 o	2	19	50
o	39	o	34	50	2	20 80	2	39	40
o	45	50	40	25	2	57 60	3	19	30
o	48	75	43	12	2	76 o	3	29	25
o	52	o	46	o	2	94 40	3	39	20
o	55	25	48	87	3	12 80	4	9	15
o	58	50	51	75	3	31 20	4	19	10
1	1	75	54	62	3	49 60	4	29	05
1	5	o	57	50	3	60 o	4	39	00
1	8	25	60	37	3	78 40	5	8	95
1	11	50	63	25	3	96 80	5	18	90
1	14	75	66	12	4	15 20	5	28	85
1	18	o	69	o	4	41 60	5	38	80
1	21	25	71	87	4	60 o	6	8	75
1	24	50	74	75	4	78 40	6	18	70
1	27	75	77	62	4	96 80	6	28	65
1	31	o	80	50	5	15 20	6	38	60
1	34	25	83	37	5	33 60	7	8	50
1	37	50	86	25	5	52 o	7	18	45
1	40	75	89	12	5	70 40	7	28	40
1	44	o	92	o	5	88 80	7	38	35
1	47	25	94	87	6	7 20	8	80	30
1	50	50	97	75	6	25 60	8	12	25
1	53	75	100	62	6	44 o	8	28	20
1	57	o	103	50	6	62 40	8	38	15
2	o	25	106	37	6	80 80	9	8	10
2	3	50	109	25	6	99 20	9	18	05
2	6	75	112	12	6	97 60	9	28	00
2	10	o	115	o	7	20 o	9	37	95

constructed to carry deck cargo; also, that although defendant had not given plaintiff express notice, yet he ought to have been aware of the usual course of business, and to have insured at a higher rate of premium. It was admitted that in the case of hemp and other damageable goods, the shipper would be entitled to notice of stowage on deck, but defendant contended that tallow not being liable to damage by the sea did not come within the above category. The question for the jury was, did any exceptional custom exist in the case of tallow, with respect to the shipowner taking risk of cargo on deck. Verdict for plaintiff.

Casks. Russian tallows are in casks 8 feet by 6, containing 12½ to 13 cwt., and 6 feet by 4, 9½ cwt. gross. 120 poods gross weight makes a Petersburg last; 63 poods an English ton. A pood is 36 lbs.

Freight. When Black Sea wheat is 4s. 7'670d. $\frac{1}{4}$ quarter freight, tallow is rated at 30s. $\frac{1}{4}$ ton; see table at commencement, but especially the report of the Committee on Freights at the close of the article grain. When Mediterranean wheat is 1s. $\frac{1}{4}$ quarter, tallow in casks is rated at 6s. 8d. $\frac{1}{4}$ ton of 20 cwt. Tallow pays two-thirds the freight of clean hemp or flax on the gross weight, and the freight per ton of tallow multiplied by 3 and divided by 20, to which add 3 $\frac{1}{4}$ cent., will give the proportionate rate payable on a quarter of wheat.

Tonnage. 17 tons tallow occupy 850 cubic feet or one keel, being the same as for 10 tons clean hemp. 42 casks, each 50 inches long, 30 bilge, and 27 head diameter, measure 850 cubic feet. Bengal and Madras ton 20 cwt. in cases or casks. Bombay 50 cubic feet. New York and Baltimore six barrels. A ton of Baltic tallow is freighted same as two-thirds freight of clean hemp on the gross weight.

Table showing the Proportionate Quantities of Quarters, Charges, and Tons Tallow in any number of Chetwerts, from Five to Six Thousand.

Chetwerts.	Quarters.	Charges.	Tons Tallow.	Chetwerts.	Quarters.	Charges.	Tons Tallow.
5	3 $\frac{1}{2}$	6 $\frac{1}{2}$	3	3200	2304	4160	356 $\frac{1}{2}$
10	7 $\frac{1}{2}$	13	1 $\frac{1}{2}$	3300	2376	4290	367 $\frac{1}{2}$
25	18	32 $\frac{1}{2}$	2 $\frac{1}{2}$	3400	2448	4420	378 $\frac{1}{2}$
50	36	65	5 $\frac{1}{2}$	3500	2520	4550	389 $\frac{1}{2}$
100	72	130	11	3600	2592	4680	400 $\frac{1}{2}$
800	576	1040	89 $\frac{1}{4}$	3700	2664	4810	412
900	648	1170	100 $\frac{1}{2}$	3800	2736	4940	423 $\frac{1}{2}$
1000	720	1300	111 $\frac{1}{2}$	3900	2808	5070	434 $\frac{1}{2}$
1100	792	1430	122 $\frac{1}{2}$	4000	2880	5200	445 $\frac{1}{2}$
1200	864	1560	133 $\frac{1}{2}$	4100	2952	5330	456 $\frac{1}{2}$
1300	936	1690	144 $\frac{1}{2}$	4200	3024	5460	467 $\frac{1}{2}$
1400	1008	1820	155 $\frac{1}{2}$	4300	3096	5590	478 $\frac{1}{2}$
1500	1080	1950	167	4400	3168	5720	489 $\frac{1}{2}$
1600	1152	2080	178 $\frac{1}{2}$	4500	3240	5850	501
1700	1224	2210	189 $\frac{1}{2}$	4600	3312	5980	512 $\frac{1}{2}$
1800	1296	2340	200 $\frac{1}{2}$	4700	3384	6110	523 $\frac{1}{2}$
1900	1368	2470	211 $\frac{1}{2}$	4800	3456	6240	534 $\frac{1}{2}$
2000	1440	2600	222 $\frac{1}{2}$	4900	3528	6370	545 $\frac{1}{2}$
2100	1512	2730	233 $\frac{1}{2}$	5000	3600	6500	556 $\frac{1}{2}$
2200	1584	2860	244 $\frac{1}{2}$	5100	3672	6630	567 $\frac{1}{2}$
2300	1656	2990	256	5200	3744	6760	578 $\frac{1}{2}$
2400	1728	3120	267 $\frac{1}{2}$	5300	3816	6890	590
2500	1800	3250	278 $\frac{1}{2}$	5400	3888	7020	601 $\frac{1}{2}$
2600	1872	3380	289 $\frac{1}{2}$	5500	3960	7150	612 $\frac{1}{2}$
2700	1944	3510	300 $\frac{1}{2}$	5600	4032	7280	623 $\frac{1}{2}$
2800	2016	3640	311 $\frac{1}{2}$	5700	4104	7410	634 $\frac{1}{2}$
2900	2088	3770	322 $\frac{1}{2}$	5800	4176	7540	645 $\frac{1}{2}$
3000	2160	3900	334	5900	4248	7670	656 $\frac{1}{2}$
3100	2232	4030	345 $\frac{1}{2}$	6000	4320	7800	668

1135. TAMARINDS are packed at Calcutta and Madras in casks, cases, and bags. Casks weigh about 200 lbs., and cases (sugar cases) 1 cwt.; the bags at Madras, 150 lbs., are usually shipped as broken stowage. Bengal and Madras ton 20 cwt., Bombay 18. In Bengal cases and casks tamarinds are shipped all the year round. In the West Indies the pods are gathered in June, July, and August, when they are fully ripe.

1136. TAPIOCA is obtained from the root of a shrub which grows in the West Indies, South America, &c. The shrub is the *manioc jatropha manihot* or *bitter cassiava*, a native of tropical America, and grows freely anywhere between Florida and Paraguay. Bengal and Madras ton 50 cubic feet. At Bahia 16 cwt. in bags and 14 cwt. in barrels. A barrel weighs about 1½ cwt.

1137. TAR is obtained by smouldering the heart wood of the pine in stacks, nearly as in making charcoal, and collecting the sap in trenches. It is refined by heating it in an iron vessel, to drain off the water and pyroligneous acid; and after awhile pouring off the purer part, leaving the earthy residue. A full cargo does not require ballast except the ship be large, when about 30 to every 500 tons burthen will be necessary. Some stevedores recommend the skin and ceiling to be covered with sawdust sprinkled with water, to prevent leakage from running into the pumps, which require special attention with this description of cargo. From America to Europe it is usual to have some turpentine to throw down the pumps when choked, as being the only available substance by which tar can be dissolved. Pumps fitted with long loose wood toggles, instead of leather clappers, will, it is said, raise tar. When tar and turpentine go together, the former should be stowed in the extremities to avoid pressure, and to keep it off from the pumps. Place the barrels each side the keelson, bilge and cutline with each other, with small billets of wood between to prevent working at sea. Tar, turpentine, rosin, &c., should have flat beds of wood under the quarters an inch thick, and allowed to stow six heights. Tar taints and injures many descriptions of goods; see flour and responsibility. In the docks at Hull tar and turpentine are stowed only in an open yard or outbuilding; rent by agreement. Tar is very liable to leak; at Archangel it is put into the barrels at a temperature of about 40°, and then sent to England, where it may be 60°, and re-shipped for the East and West Indies, where the temperature may be 96°, which will cause an expansion of 4 ¢ cent. and a consequent leakage. It is recommended to put only 32 gallons into a 34-gallon cask, especially when they have to be stowed in a steam-ship; see turpentine.

1138. Many fatal results to seamen and passengers are caused by the noxious gas which emanates from coal tar in broach in the fore hold where it is too frequently kept. The timbers of the ill-fated *Eclair*, afterwards called the *Rosamond*, were saturated with coal tar as an antidote for dry rot, and to this circumstance is attributed the malignant fever which carried off her crew. Coal tar for present use is recommended to be kept in an iron cask, lashed on the fore part of the upper deck. In November, 1863, the Swedish schooner *Victor Auguste*, loaded at Pitea in the northern part of Sweden, 818 barrels of tar, averaging each $27\frac{1}{4}$ gallons. The barrels averaged $2\frac{1}{2}$ feet long, 22 inches diameter in the bilge, and 20 inches at the ends; and weighed about $3\frac{1}{2}$ cwt. Ninety-one barrels were stowed on deck. So laden she drew $10\frac{1}{2}$ feet aft and 10 forward. With eight keels Newcastle coal she drew 11 feet aft and $10\frac{1}{2}$ forward. This schooner is 77 feet long, 21 feet 7 inches broad, and 37 feet girth. Hold tonnage 112.75, break aft 3.11, total 115.86 tons.

Tonnage, Freight, &c. 100 barrels Archangel tar 16 tons, 100 barrels of Stockholm tar 16 tons, 136 barrels American tar and rosin 17 tons, will occupy 850 cubic feet or 1 keel. A vessel which can take 318.7 tons measurement, can stow 500 barrels tar and 100 tons clean hemp. A vessel of 220 tons register will carry 1,553 barrels tar; see pitch. E.I.Co. 6 barrels to a ton, New York the same. On the Crinan Canal 8 barrels of tar go as a ton. When wheat is 1s. $\frac{7}{8}$ quarter freight, Archangel tar is rated at $11\frac{3}{4}$ $\frac{7}{8}$ barrel, and American $8\frac{1}{4}$ $\frac{7}{8}$. A barrel of tar weighs $3\frac{1}{2}$ cwt.; a last consists of 12 barrels; at Rotterdam 13 barrels.

1139. **TARES AND ALLOWANCES** according to the practice of the London Waterside Customs. In cases where goods cannot conveniently be weighed net, the weight of package, all internal wrappers, papers, strings, &c., should be ascertained and deducted from the gross to produce net weight; this is termed taring, and is practised in the following several ways, viz. :—

By Actual Tare: Turn out the goods, take the weight of each package and enclosure, which deduct from the gross. This is performed by landing waiters, all other descriptions of tare being settled and written off in words at length, with initials and date, by landing surveyor.

By Average: When packages vary little from each other a limited portion is selected by the landing officer, their contents turned out, and from them, when tared by the landing surveyor, an average is struck, and allowed upon the whole number.

By Per Centage: When packages vary considerably with one another in their gross weights, but bear a relative proportion, it is usual to select a few differing that shall altogether equal the average

weight, then turn out, tare, and convert these either into a percentage or a per package rate, and apply as before.

By Allowed Tare: This is an adjudged or estimated allowance, agreed upon by the landing surveyor and the merchant, or his agent, and applied either per package, per cent., or by proportionate deduction, as may be most convenient.

By a Super Tare is meant a special allowance granted for the increase of weight a package may have imbibed in a leaky ship; or when gross weight regulates the tare, as in British plantation casks of sugar, from part of the contents being washed out.

Draft is now allowed by the Customs on the article of tobacco alone.

N.B.—Tares once adjusted by the landing officers in conjunction with the merchant or his representative must stand as final, G.O. No. 114, 1848; and officers are strictly enjoined not to take any cognizance of goods after they shall have been passed and delivered, without the express sanction of the Board. G.O. No. 63, 1850.

1140. TARTAR, the sediment from wine, said to be cream of tartar in the rough state, and not quite so heavy as soda. Great quantities are shipped in the London steamers at Naples in large casks of various sizes, 18 to 20 cwt., and stowed the same as dry goods.

1141. TEA. The principal ports in China are Canton, Amoy, Foo-chow-foo, Ningpo, and Shanghai.

Souchong is a corruption of "Siau-chung," meaning "little plant."

Hyson is derived from "Yu-tsien," meaning "before the rains;" some say from "Hi-chun," meaning "flourishing spring."

Pekoe, the name applied to the coarse leaves gathered earliest, is a corruption of "Pec-co," meaning "white hairs,"—the very young leaves having a white down upon them.

Bohea, now obsolete, was derived from the name of the Bu-i Hills, in the province of Canton.

Most commonly there are three periods of gathering tea in China; the first commences about 15th April, the second at Midsummer, and the last in August and September. Another authority says, there are four distinct **tea harvests**. The first is in April, when the young leaves furnish the very finest kinds. The second in May, is the principal one as regards quantity; from the earlier portion of this harvest is supplied the "new season's tea," which dealers advertise in August and September, and which is so eagerly awaited

that it is the custom for the merchant who receives the first cargo to reward the celerity of the vessel bringing it, by presenting a handsome premium to her owner and master. The third harvest is in July, and the fourth in August, when the "stripping" affords only large coarse leaves, consumed chiefly by the poorer classes of Chinese labourers. The Assam season for tea making commences generally about the middle of March, the second crop in the middle of May, the third crop about the first of July. The names given to the different teas refer more to the time at which they were gathered than to their quality, of which, in each kind, there is every grade.

1142. The hold should be well ventilated with windsails several days before receiving cargo. To do this when full, vessels have large ventilators fitted forward and aft, which are much approved; shippers prefer a vessel supplied with them, if she is in good order and well painted. Sometimes for the reception of tea the holds are white-washed, which makes them light and sweet, but it causes the ironwork to rust. It is contended that the iron should be painted red and the woodwork scraped clean. The heavier the ballast the better; it is generally metal, or granite built in; these are covered with shingle, which is much approved, and about three-fourths of the whole are levelled over the keelson, even with it or below it, as the case may be—the depth being regulated by a gauge to receive so many heights of chests between the beams and the ballast, which is first covered with half-inch fir. The Chinese stevedores are not surpassed for good stowage in any part of the world, and the course usually observed by them at Canton with, say a ship of 500 tons register, has been thus described:—"Tiers of chests are laid fore and aft, say five from side to side—amidships eight tiers. Take a set between the 'midship tiers and the end tiers and set them up square and tight; then three or five tiers more, both amidships and aft, and set them up perfectly square from one wing to the other; if the tiers come in regularly up to the meeting of the chests of tea, they are dropped in in pairs, or what is termed 'married;' but if they require setting, the whole tiers are set upon and the last dropped in. This tier, when completed, is gauged in like manner as the ballast, from underneath the beams, to see they are perfectly level. Slips of wood are put on should there be the least hollow; and if any chest stands high it is lifted, and the ballast robbed to make the tier level, but should the deviation not exceed one-eighth of an inch, the mere jumping on the chest will do. The gauge is then lessened one tier, and it is carefully tried fore and aft, to see there is no discrepancy. This method is pursued up to underneath

the beams, and when that is completed, if no convenient chests can be had to suit the height of the beams, the beam-fillings are five and ten catty boxes, placed so as to make a level as near as possible, and all deficiencies filled in with China fir. Great care is taken with this tier, the height being measured from the upper beams and the stowing goes on as it did below. When the deck beams are reached, caution is necessary in order to make the stowage of the ship advantageous to the owner, as it is not always that chests are to be had to suit the filling close up to the upper deck—five catty-boxes being the least to fill up a space often 14 by 12 inches. On rising from the ballast in the lower hold, close to the skin, from the fore shoulder to abreast the mainmast, it is necessary to keep the tea at least nine inches from the sides.” Some gauges are in the form of a light square frame, others are formed like a capital T, but they are not so reliable as square frames, on account of the occasional inequality of the hold beams, oak especially, the hollows of which might not be detected with T frames; sometimes a simple measuring rod is used, at others two half-rods, sliding-gunter fashion. When stowing the last chest in an early tier, a Chinaman rather than strike it with any hard instrument walks off to a distance, and running back jumps into the air and falls in a sitting posture on the chest, which is thus sent uninjured into its place. Formerly when a tier was “commanded,” and the screws used to gain an inch, the whole tier was sometimes crushed; now if screws are used a plank is so placed as to take a whole tier and prevent injury to any chest. Experienced stevedores are too correct in their measurements to require the frequent use of screws.

1143. Sometimes strips of Bamboo are nailed up and down the side lining, and over the deck, to preserve the tea boxes from the influence of chafe, and from damage by leakage; by its silicious exterior bamboo resists wet and carries it off; the throats of the beams are muffled with canvas, or sennet nailed across the upper part, and led down so as to train any leakage towards the sides, and thus prevent water from running along the beams to the stanchions, where it will edge off and fall into the centre of the cargo. It is particularly necessary to muffle the beams in the wake of the fore topmast backstay bolts; it would be prudent also to do so immediately below all scuppers. Damage from causes mentioned here seldom amounts to *an average*; and the insurer being freed the loss falls on the merchant, who would have some difficulty to establish a claim for bad stowage or insufficient dunnage, but he would afterwards prefer chartering some other ship, on board which more

caution is observed. The lower tier should be on their bottoms, because the soldering is more perfect ; but the chests are sometimes stowed on their sides for the sake of getting in heights ; the other tiers on their sides or edges, as they will come in for heights. In the wings are occasionally stowed the remaining fourth of the ballast, or (in American ships) mats of cassia ; for it sometimes happens that this portion of the ballast is required to trim the ship, either forward or aft, in which case the wings of most tea-laden ships, is liable to make them roll ; in the ends it makes them twist at sea. Some contend that its best position for sailing is in a trunkway on the keelson ; this involves much loss of stowage for the tea, but the gain in sailing may more than compensate. For a ship constantly in the trade, iron kentledge is best ; granite is dear in the north of China, but reasonable at Canton. The heat of tea, like many other dry cargoes, will draw dampness from any porous stone previously in contact with water. Some ballast from Australia is very unsuitable ; many cargoes have been delivered in London out of condition and flat, in consequence of being stowed on Sydney ballast, which is a porous sandstone. It is better to leave out the wing chests, for if wetted one inch it will run through the whole chest ; sometimes half chests are stowed here, but they must be well ballasted off from the skin. In order to assist in protecting from injury by leakages, chests of tea are sized and stopped with a composition of blood, &c. ; they are then covered with plain paper, and afterwards with transparent paper having figures on it. Both these papers are pasted on. The boxes are afterwards ranged in stacks, and one side being oiled, the sides are changed until the boxes are oiled over completely. When applied the oil emits a very obnoxious stench, which is said not to be injurious to the contents. Every chest and catty is carefully lined with a loose leaden case, and that again with paper. The leaden case is very strongly soldered with a bright metal, which is said to contain quite an appreciable quantity of silver. (The lead of which the case itself is made is much harder than our lead ; nearly all of it that reaches this country is used for making printers' types.) The chests containing green teas are frequently lined exteriorly to the lead lining or case, with spathes of the maize plant, or with other kind of broad leaves, and many of the "catties" of very fine teas are so elaborately decorated, that after arriving in this country they often do service for years as ornaments in the windows of tea dealers and grocers. Although Chinese artificers work very cheaply, the labour and skill, of so many kinds, involved in this careful packing and elaborate ornamentation cost money nevertheless, and add materially to the first cost.

1144. **Macao.** The barque *Grasmere*, Capt. T. S. STOCKMAN, belonging to Messrs. DEVITT and MOORE, left Macao 9th November, 1869, with 630 tons (of 42 feet) of tea, consisting of 1,807 chests, 200 half-chests, and 18,517 boxes, with 90½ tons (of 50 feet) of Canton matting, consisting of 762 rolls. She had 100 tons of shingle ballast and the dunnage consisted of Canton small cane, shipped as dunnage, for an alleged deficiency of which, on delivery, a claim of £6 10s. was made and refused. As there is always a deficiency, masters are recommended not to sign bills of lading "accountable for quantity delivered." The *Grasmere* is 142 feet long, 28½ broad, and 17½ deep; so laden she drew 14 feet 6 inches aft; her best trim at sea is on an even keel; with 660 tons of coal shipped at different places in Sydney and Japan, she drew 16½ feet forward and 16½ feet aft. Her **port charges** at Macao were about £1 4s ton on the whole.

1145. At **Whampoa**, with ships rather full in the bottom, it is the practice of the Chinese stevedores to spread the ballast (stone) fore and aft to about the level of the keelson. The remainder is neatly built up wall-fashion, perpendicular, in the bilge or belly; the space between is filled with tea. A ship of 777 tons register, carrying it is said, 1,500 tons general goods, was thus stowed in 1854, and the mode was found to answer well at sea. In her case the side ballast extended from a little abaft the pump-well to the foremast, beginning and ending where the surfaces of the walls met the sides of the ship at each end. It was about six feet high, and there was sufficient space above to stow two tiers of chests. It is almost unnecessary to add that this mode cannot be used economically in wall-sided ships.

1146. **Mats.** Canton matting is shipped all the year round, chiefly at Whampoa. It is in bales and rolls varying in length from two to six feet, and averaging 56 lbs. in weight. It is usually brought to Europe in the 'tween decks amidships, clear of iron beams, stanchions, and ties, and in stowing should be treated like bale goods. By proximity, Canton matting will injure preserved ginger in cases. It is frequently brought in tea ships. A ton for freight 50 cubic feet.

Size of roll.	Length.	Measurement.	Packages in a ton of 40 feet.	Packages in a ton of 50 feet.
		Cubic feet.		
3'4	40 yards.	3'6	11	14
4'4	"	4'8	8½	10'4
5'4	"	6'0	6½	8½
6'4	"	7'2	5'6	7

1147. At **Canton**, the seller pays the export duty, and tare is taken between the merchant and Customs' officer, by each party selecting so many chests out of every 100, which being first weighed in gross, are so afterwards tared; the average is assumed as the **tare** of the whole. On this principle the tares of other goods in packages are taken. At the other Chinese ports the buyer is responsible for the duty, which is paid upon the same weights as he pays the native merchants. In a parcel of 600 chests (which is a chop of congou tea) 20 chests are selected by the buyer and weighed for the gross; 10 others are also selected by him and, their contents being turned out, they are weighed for tare. The result, net weight, is adopted by seller, buyer, and Customs' officer; the latter is seldom present, but reserves to himself the right to re-weigh if he has any cause for suspicion. In China a port clearance is designated a **grand chop**.

1148. Catty boxes could be procured only at Canton formerly, now they are to be had at all the ports, but not so plentifully as at Canton; they are shipped in bundles of four tied together, and if so delivered in London, receive full freight; if the rattan is cut, and the boxes used for small stowage, half freight only is paid. Tea ships will stow 50 to 60 p cent. over their register tonnage, and so much as 75 if supplied with an assortment of catty or other small boxes. Large quantities of matting in rolls are also shipped as cargo, with teas. On an average, tea from Shanghai weighs heavier than that from Canton.

1149. Some merchants object to the importation of any other article whatever, excepting silk, in the same hold with tea; silk, however, contains moisture, and when in large quantities, is liable to injure tea. Japan waste silk (the combings after the silk is drawn) emits an offensive exhalation highly injurious to tea, and when in the same hold has been the cause of several actions at law. The presence of even 20 chests of rhubarb may give a cargo of tea a bad character. Sugar is prohibited in China, as its fumes are highly injurious. Cassia is never put into a tea cargo for England; for America cassia in mats is always shipped without prejudice to the cargo; the mats which contain 1 lb. and 2 lbs., each, are stowed under the beams, &c., and where nothing else will go. Partridge canes and small bamboo sticks (used for umbrellas, &c.) are often shipped at Canton at a low freight for dunnage, and so expressed in the bill of lading. Great care should be taken to keep tea apart from any article likely to create strong fumes; from ship chandlery of every description, from boatswain's stores, such as ropes, cordage,

and sails, the latter having much tar in the roping and seaming ; these stores should be all stowed on the upper deck, the seams of which require to be examined frequently on the voyage home, for the damage done to one chest will often destroy many others near. Tea stored on the first floor of a warehouse has been seriously deteriorated in value by the fumes of a cargo of oranges placed on the ground floor.

1150. Tight ships in the China trade are more liable to injure their cargoes than ships which leak a little, as the effluvia from the bilge-water of tight ships will be more injurious, especially where there are 'tween decks. Bilge water naturally affects tea ; and where a ship is tight, clean water should be let down and pumped up again at least once every week. Sir WILLIAM BURNETT's fluid, or a pint of chloride of lime in each bucket of water will be very efficacious. The bilge-water in ships carrying rice, exhales an effluvia of the most noxious character ; when it falls into the bilges it ferments speedily, and cargoes of coffee especially have been greatly damaged thereby. Bilge-water impregnated with fermented rice has been known, when the pumps are used, to turn the white paint of a ship's mainmast to a bluish lead colour, and to injure in the same manner the new paint of a ship lying alongside. Split or whole peas, Indian corn, grain, &c., bottled beer in straw, &c., are very injurious. Some contend that every ship carrying tea should be provided with bilge pumps, and that no ship which has carried grain, sugar, coal, or any similar cargo, should take in tea before her hold has been washed with lime-water, and every particle of the old cargo extracted from the ballast and the bilges. The bilge-water from oak (Yorkshire especially) and East India teak-built ships, is very offensive. Oak and other hard woods eat out and rust iron bolts, spikes, nails, &c., and generate verdigris from copper, which increases the offensiveness, of bilge-water. Ships built of American pine or other resinous woods do not generate bilge-water so injurious, and their cargoes consequently suffer less. Some consider that new iron ships are not well adapted for carrying tea—first season especially. An experienced taster can, it is said, quickly discover that a chest of tea has been brought in an iron ship. They "steam" occasionally, and when the steam condenses under the decks and beams, and drops, the packages below become damp, and are, of course, injured. Many American and English tasters smoke tobacco while performing their duty ; they take the cigar out of their mouth, sip, and resume it immediately. It is said that as smoking is universal in the United States, a taster who smokes is best qualified to judge of the suitability of the tea for the American market.

1151. On the voyage home it is very necessary to keep a tea cargo perfectly dry ; for this reason every precaution should be adopted. Leakage not unfrequently occurs through the scupper holes ; the flange or leaden lip of the scupper is often tripped up by the gunwale of a barge or boat lying alongside ; the copper nail is loosened and subsequently knocked out, and leakage ensues. When the scupper gets choked with a piece of coal or any such substance, a broom-stick, iron rod, or crow-bar, is thrust in without caution, the lining is stabbed, and a concealed leak is created. Leaks behind the pipe of the head pump are sometimes hidden for a long time. After heavy weather, one of the first places where leakage occurs is around the fore top-mast back-stay bolts. There is always a heavy strain here from the jib-boom, flying jib-boom, and head sails, caused by the severe jerking which is created when the ship falls forward in the trough of a heavy sea. The water first obtains slight access in the after parts ; the ship goes into harbour and the bolts rust ; she goes to sea again, when the strain works off the rust and more water is admitted. Fire-tarred iron bolts, one-sixteenth or even one-eighth of an inch larger, should be inserted, and they should afterwards be watched carefully. For other leakage liabilities, see the articles grain, master, and mate.

1152. Ships with a broad beam are best adapted for carrying tea ; what is lost in speed is more than gained in stowage. The *Kelso*, 529 tons register, carries out, not deep, 800 tons coal, home 820 tons tea ; length over all 145 feet, beam 32, hold 18 feet. The *Friar Tuck*, 662 tons register, a longer and narrower ship, carries, it is said, less cargo, and requires 200 tons more ballast. Both ships left Whampoa the same day ; the *Friar Tuck* was beaten by some hours to London, by the *Kelso*, which is one of the best ships known in the tea trade.

1153. Long narrow ships carry more dead-weight and measurement, but require more ballast with tea ; some of them are cranker when tea-laden than when in ballast, with the same amount in both cases. Several clipper ships require a large amount of ballast, or else they are on their beam ends all the voyage, and cannot take advantage of their sailing qualities. It seems all right in theory that length compensates for beam, but it fails in practice, as the writer (an experienced master) never saw a long narrow ship, tea-laden, that to use a paradox, would stand up until she was nearly on her broadside, and got her straight deep sides to bear on the water. If they have no passengers most ships with poops carry them half full at least with tea, frequently leaving only space enough

for the master and mate to mess in, which tends of course to make the ships crank. Merchants complain that teas and silks are often damaged by being stowed in the poop or cabin, where they get wet from leaks, or by heavy seas coming over the vessel, which must find their way down the companions or sky-lights. Not being under hatches, such goods are considered not lawfully stowed. To show the quick dispatch of ships in the China trade, an English ship 586 tons register, 800 tons burthen, commenced loading at six a.m., 10th August, 1858, left off at five p.m., resumed at six a.m. on the 11th, and by noon had completed the reception of her cargo, 8,000 chests of tea, and 1,141 bales of silk. An American ship of 800 tons passed Macao and went to Whampoa, where she discharged 13,000 peculs of Java rice, weighing every pound over the ship's side, took in a full cargo of tea, and passed Macao again on the seventh day for New York.

1154. All packages of tea are frapped round with wet rattans (split) which become dry and hard. The Chinese tie them here and there with knots, half-inch and occasionally three-quarter inch high, but pressed nearly flat in the hold ; these are of course reckoned in the measurement for freight. When breaking out tiers in the hold, with cotton hooks or otherwise, if due caution is not observed the rattans will be torn off, and on re-measurement the ship will suffer. By the breaking of chests, and bursting at the corners in handling, a cargo of tea will, on delivery in England, measure 2 to 4 per cent. more than when shipped in China. Some callipers have fine brass facings, capable of measuring with great correctness to the sixteenth of an inch. The callipers used in China are peculiar to the China trade ; they were invented by an American merchant, and are called STANBURY'S measuring rod ; it is accompanied by a table of logarithms, is wonderfully accurate, and saves much time. These callipers have also very fine brass facings. For America teas are measured in China, the freight agreed on and stated on the face of the bill of lading ; such statement is not binding, and the master has a right to re-measure on delivery ; but the right is seldom exercised in the United States.

1155. The following table, although prepared by an eminent London firm, must not be relied on as correct in every case. Another authority says, the cubical contents of a chest of congou is 4'685 feet, and of souchong 4'825, and that all the others vary so much it is scarcely possible to give even an average scale. A merchant who has had fifteen years' experience in China, remarks that the sizes mentioned are all too high ; a chest of congou at 5 feet 2 inches will

not go 10½ to a ton of 50 cubic feet ; he considers 4 feet 7 inches to 4 feet 8 inches an average for black tea, and 3 feet 2 inches to 3 feet 4 inches an average for half-chests of green. He also considers the tares 10 ¢ cent. too high ; that 25 lbs. is an extreme tare for congou, and that 23 lbs. is much nearer the mark. Another merchant thinks 23 to 24 lbs. about the average tare on congous, and 25 to 26 lbs. on souchongs.

AVERAGE WEIGHTS, TARES, AND MEASUREMENTS OF DIFFERENT DESCRIPTIONS OF TEA.

Description.	Weight.	Tarés.	Breadth.	Length.	Depth.	Cubical Contents.
	c. q. lbs.	lbs.	inches.	inches.	inches.	ft. in.
Congou, chests.....	1 0 0	25	23	17	21	5 2
— half-chests	0 2 0	16	18	15	17	2 8
Souchong, chests.....	1 0 0	26	23	17	21	5 2
— half-chests	0 2 0	16	19	14	17	2 7
Orange Pekoe	0 2 16	16	19	14	18	2 9
— catties	0 0 27	7	12	12	12	1 0
Caper catties			12	12	12	1 0
Young Hyson, ½-chests ...	0 2 18	15	17	18	20	3 7
— catties	0 0 22	6	12	12	12	1 0
Gunpowder, ½-chests	0 2 24	16	17	18	20	3 7
— catties	0 0 24	6	12	12	12	1 0
Imperial, half-chests	0 2 16	16	17	18	20	3 7
Twankey, chests, sq.	0 3 8	18	19	19	22	4 7
— half-chests	0 2 0	14	18	18	20	3 9
Hyson, chests	0 3 2	18	19	19	22	4 7
— half-chests.....	0 2 0	14	17	17	20	3 4

1156. Tea averages rather more than nine cwt. to a ton of 50 cubic feet. Taking the weight of tea (cargo with cargo) 50 feet will average 1,200 lbs., which is 10½ cwt. In China, when estimating what a ship will carry, the register tonnage, *n.m.*, is multiplied by 1,200 lbs. per ton—say 800 tons register, 960,000 lbs. net of tea. Formerly at Shanghai a ton of congou averaged 10 chests ; latterly, in consequence of their increased size, nine chests only. At Hankow the chests are so large that eight will measure 50 cubic feet. Green teas are heavier than black. Tea is computed to lose four ¢ cent. in weight between the time of shipment at Canton and of discharge in England. It will lose weight by being placed in a very dry store, and will gain in a damp store ; the difference of the extremes is said to exceed two pounds ¢ chest. Fine teas weigh heavier than common. Bengal, Madras, and Bombay ton 50 cubic feet in chests ; at New

York eight cwt. ; at Baltimore 900 lbs. green tea and 1,120 lbs. Bohea and other black tea. Eight chests of congou go to a coasting ton in England. The Admiralty allows 9 chests or 18 half-chests to a ton, and 32 tea canisters of 20 lbs. or 60 of 10 lbs. ; an Admiralty chest weighs 83 lbs. net, half-chests 36 lbs.

1157. According to *Morrison's Chinese Commercial Guide*, the following were the usual net weights and sizes of packages at Canton in 1848.

Description.	Weight.	Contents.	1866.
chests.	catties.	cubic feet.	catties.
Congou	63@64	4'085	70
Souchong	60—62	4'025	63@64
Pekoe	49—50	4'333	46
Hyson	48—50	4'000	45
Hyson Skin	48—50	4'125	40
Twankey long ...	62—65	4'864	45
Gunpowder.....	80—84	4'100	60
Imperial	70—74	4'074	56
Young Hyson.....	70—72	4'220	60

The column at the end shows the average weights of imports in 1866.

1158. A catty of tea $1\frac{1}{2}$ lbs., of silks $2\frac{1}{2}$ lbs. 84 catties of tea are estimated at about one cwt. 100 catties of tea make a pecul, estimated at $133\frac{1}{2}$ lbs. avoidupois. A **chop** is usually 600, but sometimes 1,000 chests congou. A chop also means a parcel of one kind. If a Chinaman has 300 chests of one sort of tea he calls it a chop, and gives muster accordingly. If he sells two chops of one kind, say 650 chests each, he gives samples of both parcels, although they may be precisely the same sort.

Formerly the load of a Chinese chop-boat consisted of—

IMPORTS.	Betel nut, pepper, &c. .	300 peculs.
	Bengal cotton	80 —
	Bombay and Madras ...	70 —
	Woollens, long ells.....	140 —
	Lead	600 pigs.
	Rice	500 peculs.
	Tin	500 bars.
EXPORTS.	Tea	600 chests.
	All other goods	500 peculs.

The load of a Chinese chop-boat is considered to consist of the following amounts :—

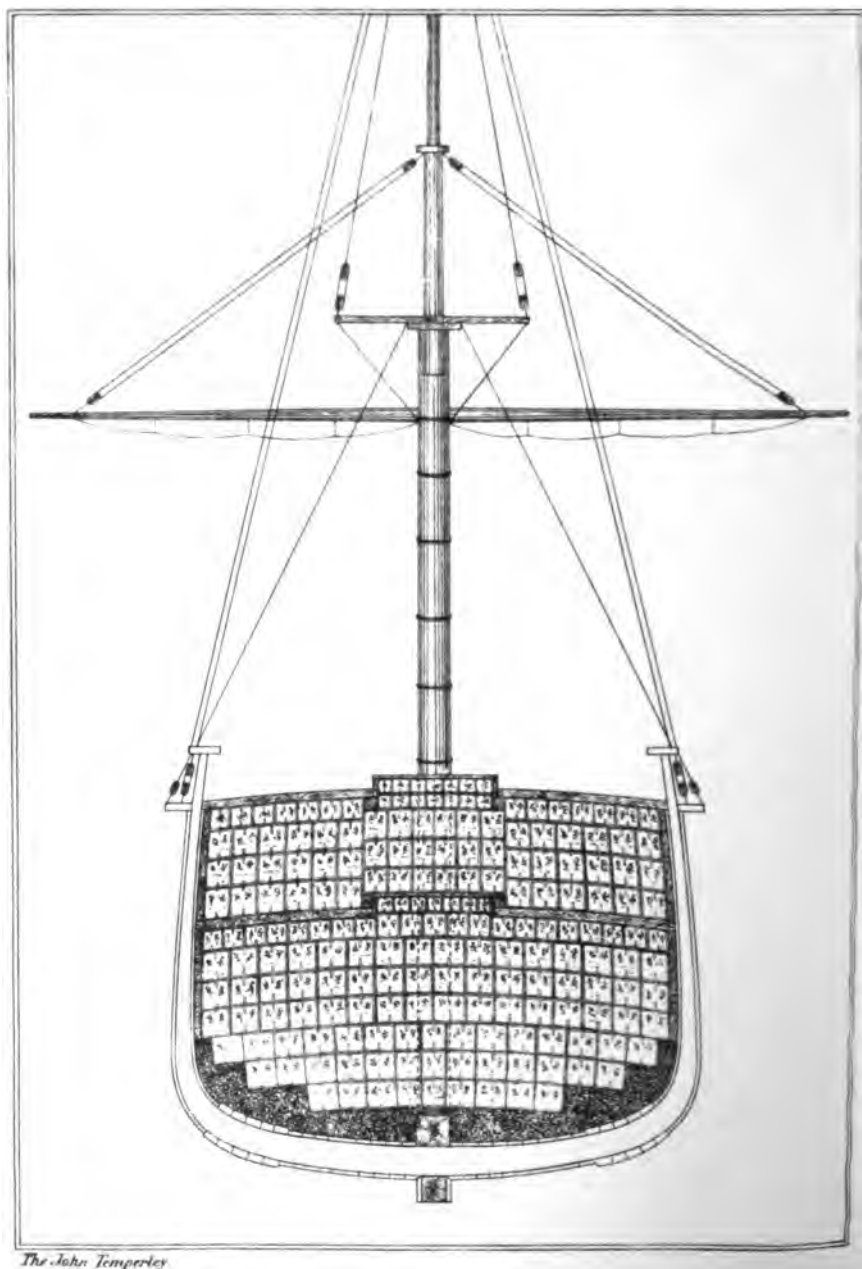
Bombay cotton	70 bales.
Madras and Bengal cotton	80 —
Longcloths	100 trusses.
Cotton-yarn	100 bales.
Dead-weight—as metals, ginseng, pepper, &c.	300 peculs.

1159. **Foo Chow Foo.** The ship *Corona*, Capt. W. S. CRONDACE, belonging to Messrs. ALEXANDER STEPHEN and SON, Marine Parade, Dundee, left Foo Chow Foo 26th August, 1869, with 1,764 tons tea, viz.: 7,605 chests, 6,293 boxes, 16,934 half-chests, and 6 packages. She registers 1,199 tons, is 209'6 feet long, 35 broad, and 22 deep; 'tween decks 200 feet. With this cargo and 360 tons shingle ballast covered with thin slabs, she drew 20 feet 6 inches aft, 20 feet forward; her best trim say 18 feet 6 inches; with 1,400 tons Cardiff coal 20 feet 6 inches. She arrived home 31st December. Her port charges on the round were at Plymouth outward (400 emigrants), £200; Melbourne, including commission (leaving in ballast), £500; Newcastle, N.S.W., going in to purchase cargo, discharge ballast, load, &c., commission on purchase of coal, £270; Shanghai, six months' port charges, commission on sale of coal, pilotage and towage, compradore's bill for crew's food, &c., and ballast, £516; there were no port charges at Foo Chow, they being paid at Shanghai; commission 5 p cent. on £4,500 freight, stevedores for stowing, towage, &c., £600. The season of shipment of new teas is during May, June, and July; for the American market September and October.

DISBURSEMENTS AT MELBOURNE.

	£	s.	d.		£	s.	d.
Customs over-time	5	11	0	Noting protest.....	0	10	6
Im. agent, feed of emigrants				Com. collecting £899 1s. 10d.	44	9	0
10 days after arrival	12	18	0	Do. transacting emigrants'			
Victoria Railway Co. con-				business	10	10	0
veying emigrants Hob-				Entering and clearing Cust-			
sons' Bay to Melbourne...	12	16	6	toms	5	5	0
PULLEN for cartage emi-				Advertising	0	17	6
grants' trunks, &c.	7	13	0	Fresh-water on leaving	1	11	2
Discharging clerk for taking				Watchmen while dischar-			
account cargo landed	12	0	0	ging at the pier	5	2	0
Surveyor overlooking cargo	4	4	0	Shipping fees, &c., dischar-			
Pilot in, 1,199 tons at 6½d.	32	9	6	ging and engaging 16 men	5	15	6
Tonnage dues, 1,199 tons at				COLLINS, stevedore for dis-			
1s.	59	19	0	charging 1,000 tons	44	12	0
Pilot out, 1,199 tons at 6½d.	32	9	6	ROWAN, for 448 tons ballast	85	0	0
Do. two removals in Hob-				ELWORTHY, butcher, for emi-			
sons' Bay at 1d. p ton ...	9	19	10	grants two days and crew			
Tug, Hudson's Bay to sea .	30	7	6	while in port	47	6	0

STEVENS ON STOWAGE.



The John Temperley

TEA.

AT NEWCASTLE, N.S.W.

	£	s.	d.		£	s.	d.
Boatmen attending ship.....	4	0	0	WOOD, taking out 448 tons			
Shipping office fees.....	0	10	9	ballast and loading 1,400			
Tonnage dues	29	19	6	tons coal	101	5	4
Pilotage in and out	45	19	4	Petty expenses.....	2	3	0
Steam-tug in and out.....	45	19	4	Commission on purchase			
Fresh meat and sea stock ...	25	0	0	coal	20	0	0
Coal baskets for loading ...	2	10	0	Entering and clearing Cus-			
				toms	3	3	0

AT SHANGHAI.

	Taels c.		Taels c.
Discharging coal and ballast- ing with 398 tons shingle and 100 mud.....\$597 0		Port charges for six months ...	534 27
Consul's fee	4 50	Petty expenses, postages, &c., \$27.	
Medical attendance	13 0		
Telegram to England to owners	12 50	The \$ was equal to 76 cents of a tael of 100 cents; the tael was equal to 6s. 0½d.	
Pilotage in and one removal...	217 0	The commission on sale of coal by broker was 1 ⅞ cent., and the duty on the coal equal to 1 ⅞ cent. more in the value of the coal.	
Supplies and stores while in port	105 2		
Towage in and out from and to mooring	330 0		

AT FOO CHOW FOO.

	\$ c.		\$ c.
Compradore's account living, &c., 2½ months	400 0	Ship chandler's account, tar, &c.	30 0
Towages in and out to sea ...	500 0	Medical attendance	29 0
Sampan attending the ship ...	46 0	Stevedore levelling ballast, stowing 1,764 tons tea, finding all dunnage and labour	225 0
Pilotages in and out	176 0	Merchant's commission on home freight	1016 39
Gilding the stern and figure- head ..	27 0		
Caulking the bends and part of main-deck	20 0		

1160. **Foo Chow Foo.** The ship *John Temperley*, 957 tons, Capt. R. LITTLE, R.N.R., belonging to Messrs. TEMPERLEY, CARTER, and DARKE, of London, took in at Foo Chow Foo, in September, 1863, 25,994 packages of tea, measuring for freight, 1,633 tons of 50 cubic feet, which gives an average of nearly 16 packages to each ton. The *John Temperley* is 174 feet long, 34 broad, and 22 deep; 'tween decks 7 feet 2 inches. With this cargo of tea and 250 tons of stone ballast she drew 18 feet 4 inches aft, and 18 feet forward; her best trim is from an even keel to 3 or 4 inches by the stern. With a dead-weight cargo she is estimated to draw 21 feet. Capt. LITTLE observes that

the usual way of dunnaging a tea cargo in China, is to level the ballast even with the upper part of the keelson—in some cases a little higher, according to the form of the ship. The depth is further regulated by taking into consideration the distance from the under part of the lower deck to the surface of the ballast, so that a calculated number of tiers of chests may come in exactly, after the ballast is *carefully* levelled and rounded down towards the wings; this rounding is done to give the tiers the exact curve of the deck and beams. The distance is measured very precisely with rods, as the ballast is being levelled, and the Chinese stevedore will thus detect the projection of the smallest stone, which is immediately removed. The ballast is covered with half-inch boards, supplied for the purpose by the stevedores at a moderate rate. The ground tier or flooring chop as it is called in China, is then laid; the lower corners of the wing chests being kept 14 to 16 inches from the bilges of the ship. The wings are then filled in with ballast, which is levelled for the second tier, and covered with planks where that tier overlaps the first; the same as under the ground tier. The second tier is laid on the first, and the lower corners of the wing chests are carried out to about 8, 10, or 12 inches from the side, according to the form of the ship and the quantity of ballast required to be stowed away. It is then levelled as before, and the third tier laid; the wing chests are brought to within three or four inches of the sides, the intervening space being filled in with small ballast kept especially for that purpose. When this tier is completed, the hold, in the estimation of a practical and intelligent seaman, has an appearance worthy of being admired—the surface looks like a splendid deck, flush from stem to stern. Above this tier the dunnage used is split bamboo interwoven trellis-fashion, say from two to four inches thick. There is no dunnage of any kind between the sides or ends of the three lower tiers of tea chests and the ballast, which is always very hard stone or shingle—porous sandstone or anything approaching to it being inadmissible. The pump-well, chain lockers, masts, &c., were dunnaged with half-inch boards the same as on the ballast under the ground tier chop. The lower deck was dunnaged with one-inch stuff; sides with split bamboo interwoven, same as below. No matting of any kind was used on the cargo in the main hold or in the 'tween decks. In stowing the tiers they are begun from the sides, and finished in the middle; see sketch. When fairly entered, two Chinamen get on and jamb them down in their places, after which the tier is beaten even at the edges with a heavy wooden mallet about one foot square, and the chests are squeezed in so tight that the wing (or end) chests take

the shape of the sides of the ship without injury to the packages, when properly stowed.

In August, 1864, the *John Temperley* took in at the same place 25,560 packages of tea, measuring 1,600 tons for freight and weighing 1,020,270 lbs., which gives an average of 40 lbs. $\frac{1}{2}$ package, and of 637 $\frac{1}{2}$ lbs. to each freight ton of 50 cubic feet. On this occasion 300 tons of stone and shingle (50 tons more than before) were kept in, as the ship was rather tender on the previous voyage. With the cargo and ballast she drew 19 feet aft and 18 forward, and was consequently eight inches too much by the stern, and did not sail so well by a knot an hour as in 1863, when the passage was made in 125 days, being 28 days less than in 1864. However, after a ship is once filled up with tea there is no means of altering her trim, so that a master cannot be too careful in watching the draught while the ballast is being levelled. The *John Temperley* was so much out of trim now because heavy weather prevailed when the tea was taken in and it therefore became necessary to use great dispatch. There were no less than 1,400 tons alongside at one time, and while cargo was loading on both sides of the ship, ballast was discharging at both ends. It was therefore impossible to control the trim with any degree of certainty. The prevailing custom is to freight the flooring chop at 10s. $\frac{1}{2}$ ton less than the other parts of the cargo. The **port charges** and expenses at Foo Chow for a ship of 1,000 tons, are from \$2,500 to \$3,000; the principal items being tonnage dues and hire of steam-tug. The former for the *John Temperley* was \$575. The towage rates in 1864, by the *Gorilla* were—

For vessels tea loaded.	1,000 tons and under.	Above 1,000 tons.
From Pagoda Anchorage to Outside Knoll (or White Dogs,) and <i>vice versa</i>	$\frac{1}{2}$ ton. 45 cents.	$\frac{1}{2}$ ton. 40 cents.
From Pagoda Anchorage to Sharp Peak, and <i>vice versa</i>	35 cents.	30 cents.

For vessels timber loaded.	1,000 tons and under.	Above 1,000 tons.
From Pagoda Anchorage to Outside Knoll and <i>vice versa</i>	$\frac{1}{2}$ ton. 35 cents.	$\frac{1}{2}$ ton. 25 cents.
From Pagoda Anchorage to Sharp Peak, and <i>vice versa</i>	25 cents.	20 cents.
Steam from Pagoda Anchorage to Foo Chow, and <i>vice versa</i>	50 dollars.	

In the event of accident while engaged, causing detention of steamer, reasonable arrangements for demurrage will be made on board by the party in charge. These rates are for cargo on board and not per register ton. Shippers at Foo Chow make it imperative to employ tugs outward; one-third of this cost is paid by Chinese underwriters, none by English. There is a competent staff of European and American pilots for the outside navigation, and of Chinese for the river. The rates are, sea-pilotage, in or out, \$3 per foot under 15 feet; over \$4 per foot. River pilotage, up or down, \$1½ per foot. Exchange 4s. 9d. per dollar.

Teas are shipped all the year round at Foo Chow Foo, but the most busy time is from June (when the new teas come down the country) until the end of the year.

1161. The barque *Caldev*, Capt. R. N. CLARKSON, belonging to Messrs. JOSHUA WILSON and BROTHERS, of Sunderland, took in 14,100 packages of tea at Foo Chow Foo, sailed 30th July, 1867, and arrived in London 20th December. She registers 482 tons, is 137·3 feet long by 28·7 × 18·1; 'tween decks 7 feet. Her ballast consisted of 125 tons shingle, placed so as to meet the heights and width of the tiers; dunnage, thin lathwood and strips of bamboo, bilges 3 to 3½ inches, sides 2½. The intake at 50 cubic feet was 656 tons, and out-put at 40 feet, 706 tons. Her draught on departure 15 feet 10 inches aft, 15½ forward; on arrival 15 feet 7 inches and 15 feet 3 inches; with 710 tons Sunderland coal, 17 feet and 16 feet 8 inches; best trim 16 feet and 15 feet 8 inches. Pilotage in at Foo Chow Foo \$4½ per foot; out the same. The season of shipment of tea at Foo Chow Foo is in July. Capt. PENTREATH, *City of Carlisle* (see the article cotton), states that at Foo Chow Foo he shipped 1,340 tons of tea. "An unfair system exists there (and at Shanghai) which is that should a master begin to load at £4 per ton and 800 tons are shipped, and bills of lading at that rate are sent away; and then a *West Country* or other ship comes in and offers to take £3 5s., every ship in the place is compelled to take the lesser freight, even for the cargo in the hold, and the masters are obliged, before any more is shipped by the merchants, to give guarantees to accept the reduced rate. If there is a rise the vessel gets no advantage. This is sometimes avoided with small vessels when the agent is firm, but with a large vessel requiring 600 or 700 tons to complete, the master has frequently to submit to the absurd custom. Masters can sometimes make a compromise by paying 1s. 6d. per ton for towage to sea (from Shanghai) by which the shippers save a quarter per cent. local insurance—3s. 6d. per ton."

1162. The barque *Velocidade*, Capt. JOHN WYVILL, belonging to Mr. HENRY WALKER, of St. Helen's Place, London, which registers 268 tons, and admeasures $120.7 \times 22.3 \times 14.3$ feet, loaded at **Foo Chow Foo** in January, 1867, from Otago, New Zealand, 4,885 packages tea mostly quarter-chests and boxes, 250 cases Chinese preserves, (ginger, &c.,) and 200 rolls matting. She was not full by 80 tons, and drew $11\frac{1}{4}$ feet aft, 10 feet 8 inches forward; her shingle ballast was 90 tons. With 380 tons coal, Newcastle, N.S.W., her draught was 14 feet aft, and 13 feet 2 inches forward; best trim at sea 12 feet aft, 11 feet 2 inches forward. For the **Australian Colonies** and New Zealand, the chests are all matted and secured with split rattans, the whole of which are allowed in the measurement for freight. There is usually a large proportion of quarter-chests and boxes for easy conveyance to the diggings. The consignees require all broken packages to be properly repaired. In China it is understood that very superior teas are not sent to Australia. The *Velocidade* loaded at Yokohama, **Japan**, in January, 1865, for New York; with 90 tons shingle ballast and 486 tons tea (40 cubic feet), she drew 11 feet 7 inches aft, 11 feet 1 forward. The tea was stowed by the chief officer; it was nearly all half-chests, matted and rattaned. The consignees were strict as to its condition; and broken packages were repaired before leaving the ship.

1163. **Shanghai.** The ship *Dilkhoosh*, Capt. W. S. GEDYE, R.N.R., belonging to Messrs. SMITH, FLEMING, and Co., of 18, Leadenhall Street, London, left Shanghai, 7th August, 1869, with 6,522 chests, 8,450 half-chests, and 3,872 boxes of tea—1,387 tons. The ballast, 310 tons of shingle, rose 2 feet 6 inches in the bottom; bilges 16, matted. She registers 816 tons, is 167.2 feet long, 32.4 broad, and 21.2 deep; 'tween decks 6 feet 9 inches. So laden she drew 18 feet 9 inches aft, and 18 feet 2 inches forward; and on arrival in London, 5th January, 1870, $18\frac{1}{4}$ feet aft and 19 forward; her best trim is six inches by the stern. **Pilotage** into Shanghai 95 taels, out 95 taels. The **season of shiment** of tea there is in June, July, and August. When the *Dilkhoosh*, on a former voyage, loaded at Foo Chow, the ballast was carried up two heights of chests; this voyage it was taken up three heights, by which space was gained rather than lost, and the ship was easier at sea. [The **cotton season** begins in October, when large vessels (at all times disliked here) have a choice of tea or cotton, but cannot load both, as there is still much risk of Chinese-packed cotton proving damp.] Tea ships of a handy size, if built of wood, generally command 10s. $\frac{1}{2}$ ton more freight.

1164. **Shanghai.** There are ordinarily in port 150 sail, which are moored in three or four lines, and occupy a length of three miles, it is therefore necessary to employ a steam-tug to put a ship just arrived, in her berth. A vessel due at Shanghai in May or June, that being the new tea season, ought to have the option of landing her cargo at a wharf stated in the bill of lading, as she may thereby save a freight. The charges at the Pootsung dock for three days are one tael, 6s. 8d. $\frac{1}{2}$ ton. The ship *Queen of Nations*, Capt. THOMAS MITCHELL, belonging to Messrs. THOMPSON and Co., Aberdeen, left Shanghai 7th October, 1864, and arrived in London, 1st February, 1865—117 days. She is 190 feet long, 32'3 broad, and 20 feet deep, and brought

3,452	Chests	}	Tea, with
3,615	Half-chests		
6,832	Packages, and		
507	Boxes		
58	Bales silk		
32	Bales waste silk		
34	Packages merchandise, and		
2	Passengers.		

Her ballast consisted of 35 tons kentledge and 230 tons shingle; the dunnage (staves and bamboo) was 18 inches thick in the bottom and 19 in the bilges. So laden she drew 17 feet 10 inches aft, and 16 feet 5 forward, which had decreased 2 $\frac{1}{2}$ inches on arrival home. Her best trim is four inches by the stern; with this cargo she was 17 inches, caused chiefly by stowing heavy teas in the after hold. The cargo was landed in good condition. Tonnage dues at Shanghai £126; pilotage in £30, out £30. At Shanghai, good ballast being expensive, ships occasionally take mud; the drainage runs under but cannot find access to the limbers. When rolling at sea, the mud in large cakes, shifts from side to side, and endangers the safety of the ship. To obviate this, stones are placed on the skin to receive the mud; the drainage then runs to the pump-well, and the mud is less liable to shift.

1165. **Shanghai.** The ship *John R. Worcester*, Capt. W. BROWN, belonging to Mr. WORCESTER, of Cannon Street, London, loaded tea at Shanghai, in 1866, and sailed 9th July; her cargo consisted of

12,500	Chests tea
221	Bales silk, and
125	Casks wine

So laden she drew 19 feet 3 inches aft, 18 feet 9 inches forward, and on arrival in London, 19 feet aft, 18 forward. Her ballast, 100 tons

pig iron, was placed each side the keelson, from the mainmast aft to the peak, and 250 tons shingle (brought from Ningpo in native junks) was levelled fore and aft, and raised a height of a chest of tea in the bilges. The shingle, obtained in a rainy season, was wet, and having been allowed to dry, was then covered with bamboos, fore and aft. The ballast and dunnage was 30 inches thick in the bottom, 18 in the bilges, and four in the sides. The tea consisted of 10,500 chests nearly all congou, and 600 half-chests; with 1,400 boxes of hyson and gunpowder. The wine was stowed aft on the ballast; the silk in the 'tween decks, two beams abaft the after hatch, on a ground tier of tea, with boxes of tea in the wings for dunnage. Eighteen days loading. For ballasting *by night* very heavy fees are paid to the Chinese Customs.

1166. With tea in a *general cargo*, dunnage bottom 9 inches, bilge 14, sides 24. It is injured by being stowed with salt, sugar, turpentine, guano, and other vapour-producing and damp commodities. One package of camphor will damage an entire cargo of tea. Hops have been known to destroy the flavour of gunpowder tea when stowed near for a short time only, and would more readily destroy the flavour of all other kinds; see general cargo. When the boxes are passed through the bonded warehouses at the Custom-house, a piece of lead on the top of the chest is cut on three sides, to take out samples, and flapped back again immediately, but it is not soldered, so that the tea is then much more liable to injure. In China this would cause the tea to spoil in two or three weeks; tea will keep in England, London especially, for four or five years, while in China it cannot be kept until the following season without serious injury. Australian ships often load tea in China as part cargo and fill up with sugar at Manilla. It is said that in 1846, tea stowed over sugar was landed at Sydney, where the packages were almost black with the fumes from bilge-water; it did not, however, appear to affect the sales there.

1167. A Chinese **ship or junk** is seldom the property of one individual—usually ten. The bulkheads by which her ten divisions are formed consist of stout planks, so well caulked with chunam and bamboo shavings as to be completely water-tight. Much loss of stowage is of course sustained; but the Chinese exports usually contain a considerable value in small bulk. The leakage made by a junk was (in 1870) bailed out with buckets from the different divisions or compartments; the Chinese seem at that period to have no idea of the advantages of a pump. When once a junk strikes on a rock or reef she is wholesale plunder for all comers; it is stated to be the

belief of the Chinese that their Joss (god) has sent them a No. 1 chance, and they seem to take instant advantage of the opportunity.

1168. **Tainted.** An important trial regarding a cargo of damaged tea took place 20th and 21st December, 1869, at the Court of Common Pleas, before the LORD CHIEF JUSTICE. The ship *Wemyss Castle*, belonging to Messrs. BLACK and Co., which registers 700 tons, and measures 183×31×17'9 feet, loaded at Foo Chow Foo in 1868, sailed in June, and arrived in the docks, London, in October. On delivery, the consignees, Messrs. BRANDT and Co., of Great St. Helen's, declared the tea damaged through improper stowage; this was resisted, but a commission having been sent to China, found that the stevedore employed had pronounced the hold unfit for its reception, having been "cleaned and dressed with kerosine oil which was not dry," but the mate persisted in having the cargo stowed. Meantime, bills having been drawn against the cargo for £8,900, and the tainting having been admitted, a conjoint valuation was made of the 1,372 packages as a guide for the subsequent settlement, viz. :—

317 half-chests	1/9 to 1/10 $\frac{1}{2}$ lb.
276 chests	2/2 $\frac{1}{2}$ lb.
257 chests	2/1 $\frac{1}{2}$ lb.
206 chests	2/1 to 2/1 $\frac{1}{2}$ $\frac{1}{2}$ lb.
316 chests	1/8 $\frac{1}{2}$ lb.

so that if the tea had been sound, it would have been worth £9,379 10s. 2d. gross; it realised at auction £6,589 1s. 10d. net, the gross amount being £6,665 11s. 0d. The difference, £2,796 8s. 4d., was the amount claimed. Defendants paid £1,000 into court and alleged that the tea had not been sold judiciously. For the plaintiffs, Mr. JOHN EVANS (Messrs. EVANS, M'CAIR, and Co.) stated that the tea was divided into nine breaks (or chops) and that two samples were extracted from each break; the two were mixed, and the mixture taken as the sample of the break; the eighteen samples from the nine breaks thus formed nine samples. Upon the discovery of the taint the tea was resampled and the same taint was found; fifty chests in each mark were examined—perhaps 400 altogether. Every chest was marked either with figure 2' fair condition, or 1' not quite so good. The price of the tea when sound was 2/2; it realised 1/6 $\frac{1}{2}$ lb. Defendants objected to the mode of marking for auction, as the marks were not to be relied upon: there is some difficulty in testing a large quantity of tea. Mr. C. W. GORDON (Messrs. EWART and Co.) stated that the sense of smell becomes deteriorated and less acute as the duty progresses. A sample from each chest was placed on a tray and he smelt it and marked its condition. Three samples were placed before him at one time. Generally three men were engaged in drawing samples, sometimes five. The operation is rapid and was conducted in the usual way. He could not depend upon his own marks after the re-inspection; he examined nearly 400 packages. A good handful of tea is taken out of each chest.

Messrs. MOFFATT and Co. bought 150 chests from Messrs. SAMPSON and Co. to whom they paid $\frac{1}{2}$ $\frac{1}{2}$ cent. brokerage. Part of this lot was purchased by ELLIOTT at 1/4 $\frac{1}{2}$ $\frac{1}{2}$ lb. The price paid by SAMPSON and Co. at the sale varied from 1/3 $\frac{1}{2}$ to 1/4 $\frac{1}{2}$ lb. Mr. W. R. ELLIOTT, of Bethnal Green Road, said he bought 50 half-chests. The people of Bethnal Green do not like the taste of tar any better than

those at the West End. Some of the tea was turned out for four or five days and he put with it some orange-flavoured pekoe, which is used for mixing only; it varies from 1/6 to 3/- p lb. [Mr. HAWKINS, Q.C. : That would produce a smell between tar and orange flower—laughter.] We sold this tea at 2/8 p lb.; the price we bought at was in bond. Turning out depreciates the quality. The judge thought that every chest should have been turned out as there was a difference of from £4 to £5 in the value, but it was stated that turning would deteriorate sound tea to the extent of from 4d. to 6d. p lb.

For the defence, Mr. BOWYER (with others) stated that if sold differently the tea would have made a much larger sum. When testing he placed his hand in the chest up to the wrist. With a crowbar the tea can be stirred up better. He does not stir up his tea with a crowbar. (Laughter.)

The jury found for the plaintiffs, with damages, £900, in addition to £1,100 paid into court, making £2,000 in all. During the trial it was stated that every one who had a catalogue is entitled to draw a sample; he is bound to send an equivalent, which must be near the mark, but is not placed in the chest until the sale is over. If high-class tea is tainted it is depreciated more in price than low-class tea. When more than a third of a break is found unsound it is treated as an "all fault" parcel. On turning out, the brokers have a scale ranging from a half-penny to 4d. p lb. When tea is mouldy it is always turned out, but not when tainted. If there had been a fire in a warehouse and six chests were damaged, the whole parcel would be inspected.

TERMS USED BY TEA BROKERS (at this trial).

- 2^c Fair condition.
- 1^c Not quite so good.
- P D Part damaged.
- O S Odd smell.
- Sea-damaged tea is not marked O S.
- T Stands for taint.
- X Shews that a chest has been turned out.
- S out Means sound after being turned out.

1169. **Tea or Silk.** ADAMSON v. DUNCAN. Before the Lord Chief Justice. Queen's Bench, 9th June, 1865. In May, 1863, plaintiff chartered the *Ann Adamson* to defendants, from London for Shanghai or Nagasaki and back, "for the round (*i.e.* for the voyage out and home), at £6 10s. p ton of 50 cubic feet of tea or silk; if other goods be shipped, freight to be in the same proportion as if those goods were tea." She discharged at Nagasaki and loaded cotton and other lawful merchandise, but no tea or silk. It was assumed that this was a full cargo, and that the capacity of the vessel for tea was equal to 769 tons of 50 cubic feet, and also that the homeward cargo was less than 769 tons of 50 cubic feet, and less than 769 tons of 20 cwt. Plaintiff contended that she was entitled "on the round" to £6 10s. p ton, on 769 tons, and defendant that freight was payable on the number of tons actually shipped according to the standard of 50 cubic feet or 20 cwt. The question turned upon the words "in the same proportion." Verdict for plaintiff, when the judge said, "In my opinion the meaning is that the shipowner is to be in the same position as if there were a full cargo of tea or silk."

1170. **Delivery.** Court of Exchequer, 21st February, 1865. Before the Lord Chief Baron. *CAMA v. HOLMES*. An action to recover from the ship *Clarendon* the value of ten chests of tea, alleged not to have been delivered on the vessel's arrival from Shanghai. They formed part of a parcel of 300; it was not disputed that the full quantity had been put on board originally. Plaintiff complained that they had not been landed, and that they must either have been abstracted from the ship before she sailed or made away with during the voyage. Defendant contended that the right number had been placed in the custody of the Dock Company, who mislaid them, if they were not stolen after they left the ship. The tellers (persons who check the cargo as it is discharged) were called, and as the jury seemed to think that if one took check and another counter-check there could not be much difficulty in setting right any mistake as to the number discharged from a ship. One of them asked a teller if their accounts varied frequently. "Very often," was the reply. "Well then," said the jurymen, "when that happens, what do the tellers do?" "Why," said the teller, "then we give way to one another." In summing up, his lordship said that the place to look for a missing thing was the place where you usually expect to find it. There had been but little search, for the tea was to go upon the seventh story, and went there, and there it was that a search had been made for the missing chests, and the search was restricted to that particular spot. If the chests were not on the seventh story a search ought to have been made somewhere else. Verdict for defendant.

1171. **TERRA JAPONICA**, the old pharmaceutical signification of the substance now called catechu or cutch, which see.

1172. **TIER**, a range of casks or packages in the hold, hence the ground tier or that next the keelson, second tier, third, upper, &c.

1173. **TILES**. One plain tile is $10\frac{1}{4}$ inches long, $6\frac{1}{4}$ wide, $5\text{--}8\text{ths}$ inch thick, and weighs 2 lbs. 5 ozs. 1,000 plain tiles make one load, and weighs 21 cwt. A pan-tile is $13\frac{1}{4}$ inches long, $9\frac{1}{4}$ wide, half-inch thick, and weighs 4 lbs. 11 ozs. 1,000 pan-tiles weigh 42 cwt.; see stone and slate.

1174. **TIMBER**. Ships of ordinary capacity will carry of the usual cargoes from American colonial ports, about 45 $\%$ cent. beyond the builder's tonnage, allowing for deck loads which would be generally equal to $7\frac{1}{4}$ $\%$ cent.; from Sierra Leone a cargo equal to the builder's tonnage in generally delivered; from Moulmein about 20 $\%$ cent. above builder's tonnage; from Savannah and Mobile about 25 $\%$ cent. above builder's tonnage; from Leghorn and Ancona, and West Indies, with greenheart, it is rarely that ships turn out equal to the builder's tonnage, perhaps from five to ten $\%$ cent. less. These computations have been taken from ships built for or employed for a long period in the trade, and have no reference to clippers built

for the Southern trade, and which have found their way into the timber trade. Timber merchants calculate that for Quebec and Baltic cargoes (not hard wood) a ship will carry one-third in loads more than her register tonnage, *n.n.m.*; this includes the usual deck loads; thus, a ship registering 500 tons *n.n.m.*, will probably carry 670 loads of timber. Ships having wooden vertical knees, are ill adapted for stowing a full cargo of timber; iron knees are of course preferable.

1175. As very large importations of timber are made from Canada, New Brunswick, &c., information relating to cargoes from those provinces, take precedence in this article; much that is said on that trade is equally applicable to other importations. The Baltic and the North of Europe follow, after which, incidental instructions are given for the South of Europe, the West coast of Africa, the West Indies, &c., the East Indies, Australia, &c.

SQUARE TIMBER is in most countries freighted by the load of 50 cubic feet; rough, 40 cubic feet.

MAHOGANY, LIGNUM VITÆ, AND CEDAR, are usually estimated by ton weight.

HACKMATAK, a hard wood, for sleepers, goes at per piece.

SAWN PLANK AND DEALS are calculated at 55 feet cube, or at a rate $\frac{1}{2}$ Petersburg standard hundred equivalent to three times the *rate* $\frac{1}{2}$ load of 50 cubic feet, and for 165 feet cube.

ROUND OR UNHEWN OAK, ELM, ASH, AND BEECH, are taken by string measurement of 40 cubic feet.

DEAL ENDS are usually carried for two-thirds freight; the quantity as a general rule, is restricted to what is required by the ship for broken stowage; deal ends are eight feet and under.

BATTENS. An entire cargo is much against the ship compared with deals at the same proportionate rate of freight.

LATHWOOD, PLANK, DEALS, STAVES, &c., are computed according to length and thickness, but the computations vary at different ports; and as they often tell against the ship, special attention must be given to prevent an undue proportion of sorts or sizes which do not stow well.

Ships at Delaware or Boston loaded with sided white oak timber and thick stuff, are paid freight $\frac{1}{2}$ 50 cubic feet for contents, as proved by seller's bill and surveyor's return at port of loading. It has been found that between the measurement of the surveyor and that of the officers of the British national dockyards, the difference against the freight ranges up to 11, and in extreme cases to 18 $\frac{1}{2}$ cent. Sometimes these charter-parties say most distinctly "the true contents of timber to be decided by surveyor, approved by Surveyor-

General of Timber at Boston." Logwood is imported in large billets or logs 4 feet in length, 18 inches in diameter, and of very irregular shape; the larger they are the more valuable. A "full and complete cargo" means that after the large timber is loaded, the remaining spaces shall be filled with "broken stowage" at half freight. Most of the standard sizes adopted in Canada, Russia, Prussia, Norway, &c., will be found at the conclusion of this article. The proportionate rates of freight at Quebec may be seen in the commencement of this work. The weight of some woods may be found in the article gravity (specific), and of others at the close of this article.

1176. **Canada, New Brunswick, and Nova Scotia.** On arrival at the port of lading it is necessary if the ship is crank and will not stand or bear transporting without much **ballast**, to keep in considerably more than may be required for the stowage; the surplus is removed in batteaux or craft, after the ship is stiffened by a tier or two of timber. This is especially the case at Quebec where the loading berths are often at a distance from the ballast ground, and the tide runs very strong, which increases the hazard. The quantity of ballast to be kept in and stowed away with the cargo, must be regulated by the ordinary stability of the ship and the specific gravity of the timber. When there is a large proportion of hard wood, ships, unless very crank, require only a little ballast; but as about 20 tons can be stowed away without material loss of cargo space, and much delay and inconvenience, and sometimes loss, results from crankness after loading, it will be better to err on the safe side, and have too much rather than too little. Generally it is found that about 20 to 30 tons will be sufficient for ships of 400 to 500 tons register, with an ordinary cargo of assorted timber; they frequently take 60 tons or more, but if so much is always required it is better to keep copper dross (which is often to be had at moderate cost in England) or other heavy ballast permanently on board. Indeed the first cost of a certain quantity of kentledge would soon be repaid when a crank ship is constantly employed in the timber trade. Where there is kentledge, copper dross, or other heavy ballast, it should be stowed as near the keelson or centre as possible, and the lighter ballast in the wings. Ships may also be trimmed by the heavy ballast, so as to facilitate their loading when the ports are placed low in the hull. Those which the Scotch term "high wooded," that is having a good depth of hold, and are thereby "tender," require to have the heavier ballast placed in the wings, or they will be liable to roll their masts out at sea.

1177. Large **Deck Loads** of one, sometimes two tiers of timber are generally carried; this tends to increase crankness. Unless a ship is decidedly stiff, it would be always advisable to keep in all the ballast which can be stowed away with cargo without loss of cargo space.

1178. The Dominion of Canada Act 1873, states that no vessel shall sail from any port in Canada to any port in Europe, after 1st October or before 16th March, with any square, round, waving, or other timber on deck, or any spare spar that is not dressed. No more than five spare spars dressed and prepared for ships' use may be carried on deck during the close period, or any cargo of any other description to any height not exceeding three feet above the deck. No vessel to sail from a Canadian port for the West Indies after the 15th November, or before the 16th June, if she has a single deck, with deck cargo higher than her main rail, or in any case not more than 4 feet 6 inches from the deck, and if the vessel has a spar deck no cargo of any description shall be carried thereon.

1179. Trench the ballast up from the keelson towards the wings, so that the ground tier shall lie firmly on the ceiling. For the ground tier some masters select pine in preference to hard wood; if pressed it will not injure the ceiling so much; the tiers should not be so long as to allow the ends of the logs to rest on the rise of the ceiling at either end of the ship. Let them run sufficiently short, say three inches off the ceiling, to prevent the corners from injuring it by the pressure of the upper cargo; for want of this precaution the ceiling is often injured, butts are started, and ships sometimes water-logged. If suitable lengths can be had, all hard wood should be stowed in the bottom—the ground tier perhaps accepted. Great care should be taken to secure a fair bearing for the lower tiers on the ship's bottom, to prevent undue weight on any part of the ceiling. Stow spare ballast at the ends of the ground, second, and third tiers, &c.

1180. After stowing three or four tiers of timber (all the ballast being stowed away at the ends and wings) and the round of the bilge is cleared, wedge the upper tier tight fore and aft, to prevent shifting, and wedge every subsequent flat tier as it is laid, until you begin to staple up. Endeavour to prevent the butts or joints of one tier from falling directly over those of the tier below, otherwise the cargo will not be so firm. When about four and a half feet from the hold beams, or when there is barely space enough left for a man to move about under them, begin to staple up each side the hold to the beams, with two or three heights, as they best suit for filling up under them. Then fill in regularly from both sides, until there is only sufficient

space left for a trunk-way, which can be filled with one or two pieces, according to the space, and which will come in from the port ; or with deals. Wedge off fore and aft, and in the midship part of the ship, up under the beams ; the wedges should not be too short, or they may work out at sea ; they should be driven lengthways with the beams, *i.e.* athwart the hold ; if driven in fore and aft, they are liable to work out by the pitching of the ship. Great caution must be used when stowing the **beam fillings**, that the timber be risen one and a half to two inches above the beams, thus preventing them from being injured by the weight of the 'twixt deck timber, when the ship works at sea. Keep the ends of the tiers in the 'twixt decks well off from the ceiling at each end, say three inches. Wedge the first tier off, and then begin to staple up against the sides, with two or three heights, as the cargo runs best for sizes ; and be sure to wedge all the upper deck beams as you come out towards the middle of the ship, filling in with broken stowage where the space requires it. Finish the 'twixt decks in the same manner as in the main hold. Do not allow the timber to rest on the half-deck nor on the forecastle deck, because they are not likely to be sufficiently wedged underneath to bear the pressure.

1181. It is usual to select the best and largest timber for the upper tiers in the lower hold, and for the 'twixt decks, as there is plenty of space in both places, and the necessity for cutting or reducing is avoided ; besides which, when discharging, the good timber is got at more speedily. At Quebec, Red and Yellow Pine is shipped in large quantities ; the red is heavier than the yellow, and should therefore be placed below ; being smaller, it causes less break of stowage than it would among the large timber above and in the 'twixt decks ; there is in stowage a difference of about 2s. to 4s. Φ load in favour of yellow as compared with red pine. A piece 50 feet long and 12 inches square measures 50 feet or one load for freight ; as it increases the measurement is much in favour of the ship thus : 17 inches measures double, 21 treble, 24 four times, and 27 inches five times that quantity. It is therefore advisable, when practicable for masters of capacious ships to select large in preference to small pine. When towing a spar have the bluff end foremost, for although more force is required to start it, yet less is necessary to maintain it in motion than with the small end foremost. You also tow nearer the centre of gravity, and in proportion do so with greater steadiness.

1182. **Deals.** Where the cargo consists entirely or principally of deals, time and expense (about 1s. Φ load) may be saved in loading and discharging, but such a cargo is not otherwise advantageous to

the ship ; in the first place the computation for freight is a loss of ten $\frac{1}{2}$ cent. as compared with timber. A Petersburg standard hundred of deals contains 3 loads 15 feet ; whereas the usual computation for freight would be only three times that fixed for timber—thus 15 feet would be lost on every standard hundred. But where deals are well manufactured they stow closer than timber, which nearly makes up the difference. Floated and second quality deals, particularly in the lower ports of New Brunswick and Nova Scotia, are generally thicker than reputed, and although nominally only 3, are sometimes full $3\frac{1}{4}$ or even $3\frac{1}{2}$ inches ; this makes a great difference in many thousand deals, of which an entire cargo would consist. Canadian bright deals are more advantageous than floated.

1183. **Pillars.** Where pillars are kept up under the beams and not regularly secured by knee fastenings, great care must be observed to secure them well before the commencement of loading, and to see that while loading there is no undue pressure on them, especially if of iron. The space between the timber, on each side of the pillars, should be filled with deals (where practicable), deal ends, lathwood, or staves, and the timber each side should be well chocked.

1184. **Hold Ports.** While loading in the American ports and at Sierra Leone, it often occurs that before the completion of the lower hold or of the 'tween decks, the sill of the ports is brought down so near the water's edge as to render it necessary to put in one or even two pieces, which should be well secured against leakage. To complete the loading it is of course necessary to pass the timber through the diminished opening, and it is therefore prudent to reserve those barks which will go in readily. It is frequently the practice to trim the ship by the stern, by passing broken stowage, chain cables, casks of water, &c., aft, as far as practicable ; this mode of raising the sill from the water is termed "gaining port." Some port sills are provided with rollers to ease in the cargo. Care should be taken in loading timber that the log be not allowed to fall on the breast hooks, otherwise the hooks may be broken or started.

1185. **Outting for Stowage.** An owner writing to the *Gazette*, 13th December, 1861. I sent a ship to load timber, &c., at Quebec. In the charter was a clause—"Timber to be supplied for beam fillings." Whilst loading, the master applied for suitable timber in lengths for beam fillings ; the shipper said he could not look out lengths, but would send a raft of inferior timber on purpose for the master to cut into his own lengths, which was done. The master complained at the same time of some crooked timber sent alongside as cargo which would stow very badly. The shipper said, "you

may cut them not to exceed ten ;" only two were cut. After discharging, the consignees demand compensation, for, as they state, damage in cutting cargo. Please say whether you consider they are legally entitled to make any claim whatever, the master having acted agreeably to his charter, under the sanction and direction of the shipper—cutting for beam fillings being a regularly acknowledged custom in the trade. The editor answers:—"There is no claim against the ship for the cut timber under the circumstances set forth ; the consignees to whom the cargo was delivered are the parties liable for balance of freight."

1186. In shipments from **Memel** and **Riga** the same attention is not absolutely necessary as in America—the timber being of one uniform diameter, the stowage is greatly facilitated. However, when masts, in conjunction with wainscoat logs are shipped there, too much care cannot be observed, or the bad stowage will be fatal to the ship's measuring out well when discharged. At Riga the rafts are floated off, and careful masters mark each timber with a hammer having the ship's name or initials on it, so that when the rafts are broken adrift, every piece can be easily identified on the beach where the timber is usually driven by the prevailing gales. At **Dantzic**, the same attention should be observed as in America, because the timber is of diversified dimensions, almost similar to that from Canada and Nova Scotia. When the cargo consists of both red and white deals, the red, being heavier, should be taken in first ; see the article mate. Dantzic timber is usually marked at both ends by the merchants so that it cannot be cut for stowage without detection ; to avoid this instances have occurred where a fac-simile of the mark has been surreptitiously used. A last at Dantzic is 80 cubic feet.

1187. **Bothnia** timber is very irregular ; it usually runs from the butt end off to a point, say from 13 inches diameter to 9 inches, and therefore stows disadvantageously for the ship. Cutting is objected to. A vessel loaded in 1867, at Gefle, a cargo of deals in lengths not exceeding 14 feet. The master was refused deal ends for broken stowage, the shipper alleging his orders were for 14 feet lengths only. The vessel stowed 80½ standard ; at Gothenburg, previously, 106½ standards.

1188. **Norwegian Timber.** Mons. BEHIC, Minister of Commerce in France, wrote a letter dated Paris, 17th November, 1866, to the French Chamber of Commerce, in which he stated that one of the usages at Christiana, sanctioned by the Supreme Court of Norway, relieves loaders from the obligation of loading timber on board ship during rainy days, and permits them to interrupt, on account of bad

weather, a loading commenced. This usage is caused by the deterioration which certain sorts of woods undergo when exposed to rain at the moment of stowing. He recommends charter-parties to be drawn up for lay-days exclusive of rainy days. Protests in Norway cost £2, and then do not relieve the master from the chance of an action at law on the part of his affreighters.

1189. Some London merchants who have had considerable experience in wood freights, complain 1st January, 1862, that the dock returns received for North American and Baltic deal and timber ships, show, in nearly nine cases out of ten, a deficiency in the number of pieces as compared with bills of lading. They instance for example, amongst many others, the following cargoes short :

1 Quebec	38 pieces staves.	6 Gefle.....	46 pieces deal.
2 Gothenburg	39 pieces deal.	7 Wyburgh ...	7 pieces deal.
3 Dantzic ...	20 pieces lathwood.	8 Savannah...	4 pieces pitch pine.
4 Quebec.....	48 pieces deal.	9 Quebec ...	650 pieces deal.
5 Cronstadt .	15 pieces deal.		

All these discrepancies are not imputed to the carelessness of the officers of Customs or Dock Companies, although a *very* large number of unclaimed deals, &c., may always be seen in the docks ; but whether it be so or not, the shipowner has to pay. It is quite clear that the masters of these ships could not have used or retained the goods. A shipmaster frequently proposes to sign bills of lading for so many pieces in dispute, to which shipper naturally objects, as it would place him in an awkward position between original vendor and consignee, and so, to avoid detention and expense of protesting, &c., the master is compelled to sign *clean* bills of lading, and the owner to pay hard cash for any deficiency.

1190. In some docks the fractional parts are not counted, thus where the exact measurements of **Norway timber** are $3\frac{1}{2}$ thick by $11\frac{1}{2}$ wide, others $2\frac{1}{2}$ by $7\frac{1}{2}$, are taken as 3 by 11 and $2\frac{1}{2}$ by 7. This contingency should not be forgotten when chartering.

1191. **Freight.** A master writes to the *Shipping Gazette*, 24th November, 1864 : " I have a vessel chartered at St. Petersburg to load a cargo of deals and battens, the latter not to exceed one-fourth, with the requisite deal ends and lathwood for broken stowage ; freight to be—deals and battens—67s. 6d. London ; 62s. 6d. Grimsby, Hull, Leith, or Tyne Docks ; 75s. Bristol, Cardiff, or Newport ; and if any boards are shipped to the latter ports, the freight to be 72s. 6d. per standard hundred ; deal ends two-thirds freight of deals. Then follows the payment, number of lay-days, and, at the foot of the

charter, the following clause—‘Should the **boards** be shipped to any of the ports mentioned, the freight is to be 2s. 6d. per standard hundred additional.’ The ship is nearly half-loaded with boards, and is ordered to Hull; and I shall feel obliged if you will say if I am entitled to 65s. per standard for deals, battens, and boards, or 62s. 6d. deals and battens, and 65s. boards. The boards are a great disadvantage to the ship, and 2s. 6d. extra freight, when half a cargo is shipped, is not sufficient to make up the disadvantage.” The Editor answers: “The settlement of the freight should be made, not at 65s. per standard for deals, &c., but 62s. 6d. deals and battens, and 65s. for boards.”

1192. **Broken Stowage.** A vessel was chartered to load at Gefle, in 1863, “a full and complete cargo of deals and battens, with ends, and (or) lathwood for broken stowage only.” The broken stowage amounted to eleven standard, although it never before exceeded three. The owner claimed freight for the eight standard in excess, and the merchant was held liable. The master when loading, had applied for proper lengths for stowage, but could obtain only 14-foot deals. The vessel, 217 tons, had frequently discharged deals from other Baltic ports, and twice from Gefle. The broken stowage always averaged less than three standard.

1193. **Mediterranean.** Rafts and floats of timber not exceeding 100 feet long by 40 broad English, pay on leaving the river **Danube** (Board of Trade, 8th May, 1863) a fixed due of 100 francs; larger rafts pay inore. Timber shipped from **Leghorn** and **Ancona**, being very crooked one way, requires nearly the same attention as that of Sierra Leone. Particulars of 585 pieces of **Walnut wood**, shipped at Genoa, January, 1864, by the brig *Eugenie*, 166·08 tons register, Capt. R. BOVEY.—

Planks.	Length.	Width.	Thick.	Weight.	Contents.	Quantity.
	ft. in.	inches.	inches.	cwt.	cubic feet.	tons.
287	10 0	15 to 30	3 to 6	1½ to 2	6½	23
194	10 6	13	4½			24·75
40	10 0	15 to 30	3 to 6	1½ to 2	6½	6·65
64	9 6	17	5			

The wood weighed about 42 lbs. to the cubic foot, and is shipped all the year round. The remainder of the cargo consisted of 81·32 tons marble, 49 tons oil, 155·5 cwt. mineral, and so laden she drew 12 feet 6 inches; with a dead-weight cargo of Welsh coal or iron her draught was 13 feet 4 inches. The marble measured 2·033 palmās or 81·32

tons for freight, and, if weighed, would have made about 86 tons English. The oil was in 161 casks, weighing 48,910 kilos or nearly 49 freight tons—1,000 kilos being reckoned to the ton, although it takes 1,020 kilos to make 20 cwt.; and the mineral was packed in 10 casks=155.5 cwt.; all gross weight.

1194. **The Rhine.** The mode of conveying timber on this river in rafts, is very curious. "Just below Andernach is the little village of Namedy, on the left bank; here the Rhine forms a small bay, where the pilots are accustomed to unite together the small rafts floated down the tributary rivers, and to construct enormous floats, which are navigated to Dortrecht, and sold. These machines have the appearance of a floating village, composed of twelve or fifteen little wooden huts, on a large platform of oak and fir. They are frequently eight or nine hundred feet long, and sixty or seventy broad. The rowers and workmen sometimes amount to seven or eight hundred, superintended by pilots, and the proprietor, whose habitation is superior in size to the rest. The raft is composed of several layers of trees, placed one on the other, and tied together. A large raft draws not less than six or seven feet of water. Several smaller ones are attached to it by way of protection, besides a string of boats, loaded with anchors and cables, and used for the purpose of sounding the river, &c. The domestic economy of an East Indian is scarcely more complete; it includes poultry, pigs, and other animals, and several butchers are attached to the suite. A well-supplied boiler is at work night and day in the kitchen. The dinner hour is announced by a basket stuck on a pole, at which signal the pilot gives the word of command, and the workmen run from all quarters to receive their messes. The consumption of provision on the voyage to Holland is almost incredible, sometimes amounting to forty or fifty thousand pounds of bread, eighteen or twenty thousand pounds of fresh, besides a quantity of salted meat, and butter, vegetables, &c., in proportion. The expenses are so great that a capital of three or four thousand florins (about £350) is considered necessary to undertake a raft. Their navigation is a matter of considerable skill, owing to the abrupt windings, the rocks and shallows of the river.

1195. **Sierra Leone.** Ballast is seldom or never required, except a little to level off or make firm the ground tier; more would be unadvisable, as ships are very deep with a full lading properly stowed. The cargo is stowed similar to other timber; but on account of the crookedness and unevenness of the logs, the peculiar lengths, the prohibition of cutting, and want of broken stowage, it is more

difficult to manage. With bow ports it is advisable to make a brow, to protect the breast-hooks, and to place ballast or other rubbish to receive the fall of the timber of the first tier. The pumps should either be hoisted up or well looked after, as the timber being generally muddy, runs in very fast; many pumps have been broken for want of this precaution. As much of the mud as possible should be first scrubbed off the timber while at the port, and every tier should be dry limed, to absorb the remainder and prevent pernicious effluvia. Particular care must be taken to have the lower logs fairly and evenly placed on the ship's bottom, so that the weight of the cargo may be equally distributed over the floors and first futtocks: the ends of the timber should be free from the skin.

1196. Endeavour to keep the tiers level; work large timber with large, small with small; put the crooked logs together so as to lay one into the other, and work crooked timber round the bows or in the after end, to prevent the main work from being thrown out. When it is not possible to work the large with large and the small with small, it may be advisable to have a tier of large say of five one side, and a tier of lesser, say six or seven on the other. As there is no broken stowage, with the exception of camwood, which is rarely obtained, and then in most instances when ships are loaded, it is of little service for stowage, great care is requisite to chock the tiers well off to prevent the cargo from shifting; for that purpose, any quantity of log-ends and wedges may be had from the shore. The tiers above the beams are seldom stowed as well as those in the lower hold, on account of want of room to manœuvre the crooked logs, and from the necessity of running in a great number of logs promiscuously, to trim the ship by the stern, and gain port to finish the loading of the lower hold in safety, as the cargo is often received in an open bay, exposed at times to a heavy sea. Careful attention is therefore required to chocking and wedging off the 'tween decks. To prevent loss it is advisable to get in all the timber alongside during the day, as at night the sea breeze blows strongly, and tornadoes sometimes occur. In ordinary weather, timber can be easily rafted down and landed at *Great Scarcies*, but during the rains the strong winds occasion such a heavy sea as to make it unsafe for a ship to lie there with her raft ports open. As logs under 23 feet are paid two-thirds, and under 18 feet half freight, it is desirable that when ordering the beam fillings, to ascertain that logs sent off as 23 feet and 18 feet, do not fall short of those lengths *even by an inch*, on any side, or reduction of freight will follow.

1197. In December, 1859, much fatal **sickness** occurred on board

the ships loading timber at Sierra Leone. A master writing therefrom at the time said :—"They make a general practice here of covering the ship so completely with sails, that it is impossible for the least breeze to get into the cabins or hold, and the timber on the *Roslin's* deck was so plentiful that one could scarcely move. The Kroomen are a very dirty set, enough so to cause a plague unless the ships are washed and kept perfectly clean, which is impossible with much lumber on the decks. Instead of covering my ship with awnings, I convert the sails into windsails, and put them down the hatchways, as it is quite necessary this African timber should be dried as quickly as possible, because it lays on shore in the mud on the banks of the rivers, for two or three years prior to shipment, and must become putrid outside." [See Admiral WILMOT's observations, in the article oil.]

1198. **Camwood**, from the West Coast of Africa, is shipped principally at Corsica, Cape Palmas, and Gabon, and a small quantity in the river Congo. If dry a full cargo may be taken; when fresh cut it loses weight on the passage home. Dunnage is very necessary, as salt-water discolours it; see the article camwood.

1199. **West Indies, &c.** The principal exports from port Manzanillo, in the island of Cuba, are mahogany, cedar, fustic, sabicu, cocus-wood (called by the Spaniards *granadillo*), *lignum vitæ*, and lancewood. All can be shipped at any time throughout the year. **Lancewood** is necessarily cut just prior to shipment, so as to be more easily bent on arrival in England; being green it is very liable to "sweat" in the hold, and to become discoloured. On the other hand, if the hatches are opened, the air admitted tends to make the lancewood rotten. It is always desirable to stow lancewood in a sugar ship, as the steam from the sugar materially improves and preserves the colour of the wood. If stowed with other cargoes it requires to be kept well ventilated, or it will turn dark and a bad colour when exposed to the air on being landed. Sabicu is in logs, the usual size of mahogany logs, but rather longer; it is used in the Royal Navy for ship building, and is much heavier than mahogany. Ships from Bristol generally make two voyages in a year to Manzanillo; the voyage occupies say $4\frac{1}{2}$ to 5 months. Coal is conveyed to Cape de Verde, the West Indies, &c., where ballast is received for Cuba. Mahogany from **Cuba and Hayti** is generally exported in logs 20 to 26 inches square, 10 feet long; from **Honduras**, 2 to 4 feet square 12 to 14 feet long, but some are larger. Spanish is the heaviest and bay-wood the lightest sort. 48 feet go to a ton of 20 cwt. as weighed at the government beam. At New York 40 feet; at Belize 47, sometimes 50 feet.

1200. **Hayti, Logwood.** The ship *Dr. F. A. S. Hunter*, Capt. SAMUEL S. TAYLOR, loaded 558 tons logwood (20 cwt.) at Auxcayes, west end of Hayti, sailed 21st October, and arrived at Penzance 30th December, 1867. The cargo was brought from the interior by oxen to the beach, weighed there by triangles, and taken off by the crew, 1½ miles to the ship, in lighters of five to twenty tons each. To help the crew (12 in all) about four negroes were employed at say 3s. 6d. p diem each. Ballast 45 tons stone. About 300 tons of the logwood was sent through the side ballast ports, which are very large; remainder over all through the hatchways. Seven weeks loading; the rain sometimes impeded the oxen. The cargo consisted of pieces 4 feet to 5 feet 11 inches long, weighing 28 lbs. to four cwt. About 400 were cut on account of their crookedness, forks, &c., for closer stowage. Each tier was wedged by small pieces driven in by larger pieces. The wood was clean but it was accompanied by centipedes, scorpions, &c., the bites of which were cured by rum steeped in one of their bodies. The logwood filled the hold, and she then drew 16½ feet; with 700 tons Cardiff coal 17½ feet. The ship was moored by both bows ahead; a hawser with large kedge astern. The sea is full of sharks, worms, &c., and vegetation was so quick that the anchor-buoy had to be cleaned frequently. The buoy should be fastened by a chain as hemp soon rots. Auxcayes is generally healthy; seamen must however be temperate and avoid sleeping in the open air. The pilots, coloured men, are not very skilful. Salt provisions are expensive; as much as £5 p cwt. has been paid for second class biscuits; fresh beef 20c. p lb.; vegetables dear; water plentiful. The **season of shipment** of logwood is all the year round. Coffee season commences in November, and generally ends in February.

PORT CHARGES AT AUXCAYES.

	Haytien dol.	American dol.
Stevedores 558 tons @ 3½ H. dol.	2053	78 98
Ballast 16 voyages @ 100 H. dol.	1600	61 54
Port charges, pilotage included	9372	363 48
Tonnage duty \$1. 10 p cent.		493 90
Doctor's visit \$5. Bill of Health \$1		6 0
		<hr/>
		\$1000 90

Haytien dollars range from 26 to 30; the loss in exchange is sometimes very heavy.

1201. A shipowner at Padstow (16th November, 1867,) says, the *Kildare* took about 672 tons logwood. She registers 611 tons.

Her expenses at Cape Hayti—**Port charges**, £353, including £12 for provisions, &c. Any ship going there ought not to have less than 38s. p ton one port; shifting ports 40s. The *Kildare* went to Cape Verde for 15s. p ton, and Cape Hayti for 36s.; back with logwood. Six months on the round. The *Storm* brought home 380 tons of logwood; she registers 333 tons.

1202. **Logwood** should be kept from getting wet, as dampness causes the wood to turn black, and the dye is thereby reduced, especially when in the leakage in the ship's lee bilge. In some of the Jamaica charter-parties there is a clause preventing masters from cutting (for stowage) more than 5 p cent. of the cargo in less than three feet lengths. As the wood generally comes alongside in lengths under six feet, it is impossible for the master to cut it at all. The insertion of this clause should be avoided. The facts are stated to be that as logwood is used principally for dyeing, it becomes necessary to pass it through the jaws of a machine which reduces it nearly to dust. Each piece put into the machine leaves an unsawn part in the hands of the machinist, whether it is long or short. This is said to be the reason why long pieces are preferred to short. The cost of sawing by machine may be 13s. p ton; the sawing of the remnants by hand may cost 30s. p ton.

1203. Timber from **Savannah** and **Mobile** consists chiefly of pitch pine, which is similar to red pine of the best quality, but of greater specific gravity. Ships of average capacity stow about 25 p cent. beyond the old measure—builder's tonnage. As it is chiefly converted into spars or planks, where length is of great value cutting is not allowed.

1204. **Mahogany**, Santa Anna. The ship *Commissary*, of Bridgewater, Capt. CHARLES HUTCHINGS, 735 tons register, took in (September, 1863,) 720 loads mahogany at Santa Anna, in the Gulf of Mexico. She is 142½ feet long, 27½ feet broad, and 20½ deep. But for the crookedness of the mahogany 100 loads additional could have been stowed. So laden she drew 17 feet on an even keel; with 968 loads Quebec timber she drew 18 feet 6 inches; with 811 tons Rangoon teak and 50 tons cutch, 19 feet; with 1,085 tons patent fuel and 20 tons dry goods, 19 feet 2 inches. The blocks of fuel were placed apart from each other, or stowed what is termed "hollow;" the bulk in the middle, diminishing to the ends. Some old wood, casks, &c., were placed in the wings. No dunnage below, but dunnage there is useful both to keep the fuel dry, and to rise the cargo in the hold. At **Santa Anna** the season for loading mahogany is from May to the middle of September—not later. The mahogany

is brought alongside in rafts at a charge of 3s. $\frac{1}{2}$ ton, paid by the ship, unless otherwise agreed in the charter-party.

1205. **Bay of Honduras.** In the bays ships generally put the timber down the main hatchway, because they are sometimes obliged to close their ports in consequence of stormy weather. At **Belize** it is customary for merchants to load with mahogany a certain proportion of logwood and rosewood; masters should receive only a fair proportion of each; mahogany is floated off in rafts. Masters should take an early opportunity of engaging an active and skilful stevedore and raftsmen who can produce certificates from previous masters, which should be very closely inspected. It is advisable not to tow off more mahogany in the morning than can be stowed in the day, as gales are frequent and rafts are liable to be blown away. Boats usually leave the ship at three in the morning so as to take advantage of the land breeze. Logwood and rosewood not being floatable, are sent off in boats. The dimensions of the timber are taken just before loading; each balk is numbered, and when it becomes necessary to cut a balk into three pieces they are numbered say 38¹ 38² 38³. Where stone ballast is necessary it is usual to place sleepers on it to receive the lower tiers of mahogany. Care should be taken to keep the ship's limbers clear, so that leakage can run freely to the pump-well. Unless the mahogany is securely wedged with the logwood and rosewood, the balks will get adrift at sea in heavy weather, choke the limbers, and endanger the ship. Some balks of mahogany are 40 feet long; balks weigh from two to nine tons—usually six to eight tons. A barque which loaded in the Bay of Honduras in 1865, took 550 tons of mahogany, 40 of rosewood, and 70 of logwood; she registers 454 tons. **Port charges** at Belize, exclusive of stevedores, &c., £27; **pilotage** £18. It is not considered profitable for all kinds of British ships to load timber here, it being necessary to knock away the cabins and other fittings under the deck. Vessels going there to load have usually to hire four winches, the loan of which, with the necessary gear, is expensive. Two of these winches are double, and are provided with strong chain say about $\frac{3}{4}$ -inch, sufficiently long to heave the mahogany up to the port; the two single winches are provided with new rope four to six inches, for use aft, through two holes cut in the deck, to bring the timber towards the stern. Timber dogs can be purchased, also a description of small rope or coir, made of cocoa-nut fibre, and floatable, for about £1 $\frac{1}{2}$ coil. The only supply of water at Belize is that obtained from the roofs of the houses after rain. Showers are frequent, and ship's sails should be unbent as early as possible. In the Manati

river, a little to the southward of Belize, and in the rivers Rio Grande and Golden Spring, about 90 miles south, excellent water is to be obtained about eight or ten miles from the sea. Provisions are dear. The yellow fever prevails. The season for loading mahogany at Belize, Honduras, &c., is from 1st May to 20th September.

1206. The schooner *Princess of Wales*, 134 tons, Capt. W. GARNER, belonging to Mr. J. TREDWIN, of Padstow, loaded timber at **Minatitlan**, in the Gulf of Mexico, which port she left 16th February, 1869. She is 92'6 feet long, 22'6 broad, and 11'3 deep. Her cargo consisted of 199 measurement tons of mahogany, cedar, and fustic, and she carried 43 serons of indigo, 200 lbs. each, in her sail room. Mahogany on the skins, on battens two inches thick, to preserve a water-course; the corners of the balks were kept well off at each end to prevent injury to the skin; stowed in tiers according to length and size; the balks were wedged one against the other, and upwards against the beams to take off the strain of the deck-load. The cedar was intermixed with the mahogany; and the fustic, in short pieces about two feet long, was used for broken stowage. As a rule indigo is brought home in serons in the ship's cabin; it is packed in mats covered with bullock skins—the hairy part inside—and stitched with hide thongs. The water in the river Goazacoalcos is drinkable: provisions are moderate. The night dew should be avoided; when fever and ague prevail, moderate doses of quinine are given. Vessels of 14 feet draft can go over the bar at the entrance to the river; the bar extends a little over two cables East and West, and is above 100 feet broad; it does not shift. The heavy northerners break right across the bar. There is no lighthouse, and as the land in the vicinity is one ridge of sand banks, with trees here and there so much alike, it is difficult to judge of the ship's position. The inland mountain St. Martin, N.W. by W. of Minatitlan, 40 miles distant, should if possible be made; by this there is less risk of damage through the northerners during the northern season. With the above cargo the schooner's draft was 10 feet 3 inches aft, and 8 feet 9 inches forward; with about 130 tons of salt, taken in at Ilha de Sal, Cape de Verds, 11 feet 6 inches and 9 feet 4 inches. **Pilotage** into Minatitlan \$12, out \$12; wharfage about \$8; a steam-tug can be obtained. A Mexican stevedore employed six men in the hold, and was paid 80 cents $\frac{1}{2}$ ton measurement. The *Princess of Wales* lay alongside the bank of the river, close to the village, which is 13 miles from the entrance. The timber was brought in rafts, and was several days coming down the river. The mahogany floated about one-third out of the water; the cedar was lighter; the fustic, not being floatable,

was brought down in canoes. A fortnight was occupied in loading ; the work was done by day only. Much of the timber shipped at Minatitlan is crooked, but is usually reserved for deck-loads: The crooked is more valuable being well adapted for ship-building. The out-put of the Minatitlan timber at Plymouth was, mahogany and nine pieces of fustic, 128 tons 19 cwt. 3 qrs. 26 lbs. ; indigo 4 tons 3 qrs. 4 lbs. ; dead-weight cargo 235 tons.

1207. **British Guyana.** The principal places for loading are in the rivers Demerara and Essequibo, both under the Customs' establishment at Demerara, in which river vessels are fastened on the land side by warps, of say 50 to 70 fathoms long, and on the off side by anchors from the stem and stern. Greenheart is the chief timber exported from British Guyana ; it ranges from 25 to 70 feet long by 10 to 30 inches diameter, and is hauled off the beach at Demerara by a derrick which retains it until the strain is sustained by the porting and topping purchases. Sometimes the bow is beached to raise the hold ports. The mud and slime are washed off alongside. Greenheart weighs about 66 lbs. 3 ozs. $\frac{1}{2}$ cubic foot, and requires no ballast. The instructions for stowing at Quebec and Sierra Leone will apply here. Stow-wood for chocking is plentiful. **Morra** timber is mixed with cargoes of greenheart from Demerara ; it ranges up to 50 feet long by 20 inches diameter, and weighs nearly the same as greenheart. All lengths of both are usually freighted at $\frac{1}{2}$ cubic foot ; sometimes by load of 50 cubic feet, according to Customs' calliper measure on delivery. Large quantities of greenheart, &c., are brought down from the interior by the winter floods, and cargoes are shipped at all seasons in the rivers Demerara and Essequibo.

1208. The United States brigantine *J. W. Spencer*, 327 tons register American, 350 English, Capt. J. W. SPENCER, took in at Demerara, in January, 1862, 11,211 cubic feet of greenheart, which was very heavy, probably 82 lbs. to 83 lbs. $\frac{1}{2}$ foot. It was in pieces from 30 to 70 feet long by 12 to 30 inches square. The cargo was purposely "blown up" to the beams to prevent labouring at sea ; it proved very inconvenient on the passage. She drew 11 feet forward and 12 aft. With 493 tons Newport steam coal, which was an overload, her draught was 12 feet forward and 12 aft. The brigantine is a large carrying ship—length 118 feet, breadth 27, depth of hold 11 $\frac{1}{4}$ feet. Capt. SPENCER recommends double-decked ships for this trade ; if single-decked, they should be very narrow and deep. Ports are indispensable.

1209. The barque *Syrophanician*, 364 tons register (of North Shields), Capt. W. T. IRVING, loaded timber in Essequibo river, in

December, 1863. She is 102·7 feet long, 24·6 broad, and has a depth of hold of 18·2 feet. The cargo consisted of 199 pieces of greenheart, of which five were cut for beam fillings and six for allowances; intake, by bill of lading, 210 logs, measuring by tape (string) 13,849 feet. Out-put at South Shields, 2nd April, 1864, 314 loads 10 feet, or 15,710 feet ∇ Queen's calliper measure; only one piece was weighed and proved to be 77½ lbs. ∇ cubic foot. The barque is an ordinary carrying ship, and with the cargo of greenheart was on an even keel, drawing 16 feet 7 inches. With a Quebec cargo, including deck load, from 492 to 520 loads, chiefly white pine (40 cuttings), say 500 loads, her draught was 15½ feet; with 542 tons Llanelly coal, 16 feet 2 inches aft, and 15 feet 10 forward; with 2,660 quarters Odessa wheat, 16 feet 3 inches aft, 15 feet 10 inches forward.

1210. Capt. IRVING suggests that a vessel chartered for greenheart should have her ports bound and lined with iron in a most secure manner. She should be provided beforehand with exceedingly strong brows inside, to receive the timber and prevent the ends of the logs from falling; the brows should be greenheart or oak, three inches thick at least, and not too steep. Where they have been insufficient, the sudden fall of the logs has greatly damaged the frame of the ship. At least three good strong iron snatch-blocks (12 inches by 7) should be provided, and strong beach ropes of Manilla hemp, 4½ to 5½ inches, and 50 to 90 fathoms long, according to ship's draught and her distance from the beach. Russian tarred rope will soon rot. Large wooden blocks are of very little service; if a balk of greenheart falls on one of them it will be smashed to pieces.

1211. On the upper banks of the Essequibo, **greenheart** is cut in the dry season, and during the freshets is sent from the wood-cutter's grant down the creeks or rivulets to his beach in the river. Being very heavy it has to be dived for at high tide by negroes chiefly from Barbadoes, who take the dimensions of each log previously at low water, and note them on a floating tally attached by a string, so that those logs best adapted for the stowage in progress, can be easily selected. Master stevedores residing in George Town, Demerara, usually contract for loading; the average rate in 1863, was \$16 ∇ 1,000 feet. Capt. IRVING estimates the weight of greenheart at 80 lbs. ∇ cubic foot. In stowing at Essequibo, the entire cargo must be well chocked. The ship has to lie one tide at least on the ground before crossing Sugar Bank, the bar of the river, and if the cargo is not properly secured, it will be shaken while she is aground, and will continue adrift for the remainder of the voyage. In measuring greenheart at Demerara and Essequibo, exporters use

the tape (termed string measure), which makes about 10 $\frac{1}{2}$ cent. less than Queen's calliper measure,* and is the usual allowance. Ships chartered in England are generally paid at so much $\frac{1}{2}$ cubic foot or load of 50 cubic feet $\frac{1}{2}$ calliper measurement on delivery. When chartered at Demerara, freight is generally paid on delivery $\frac{1}{2}$ string measure in-take.

1212. In chartering to load greenheart, permission should be given for a certain number of cuts, according to the size of the vessel, in addition to the necessary beam fillings. In the *Essequibo* the loading is often stopped through a deficiency of short lengths. Stevedores frequently use the short lengths profusely to make a show of what they term good stowage, in order to obtain the approbation of inexperienced masters. Generally vessels are in danger at sea when filled below with either greenheart or morra, and very few ships can carry a hold full of short timbers. The cargo should be blown up gradually from the first, using the short lengths with discretion; otherwise large open spaces are left above, and it becomes necessary to tom off the upper timber. Many ships have thus foundered at sea when the toms give way. The *Syrophanician* was moored in three to four fathoms, abreast of the timber on Embleton's beach, with head up the stream to meet the ebb tide. One anchor from the off-bow and another from the off-quarter; warps from the in-bow and in-quarter, to trees ashore. The timber was hove off the beach by a strong rope of $4\frac{1}{2}$ to $5\frac{1}{2}$ inches, which was rove through a strong swivel block fastened to a substantial spar as outrigger, well secured by guys, &c., from masthead and bowsprit. The timber was slung by the middle, and when leaving the beach the outer end of the balk was slung to the boat by the diver and his mate, and kept there until reaching the vessel's bow, when it was slipped. When hove up to the water's edge by beach rope, the outer and inner purchases were put on. The timber was then cleaned from slime, &c. The outer purchase is generally a strong luff tackle from the end of the outrigger; the inner purchase is a single strong purchase chain with a strong hook on the end, taken through a hawse-pipe to the windlass, to port the timber. In the hold three small strong iron snatch-blocks were required for purchases with the winch-rope, to cant and place the timber. Cant-bars, as used for pine, &c., at Quebec and elsewhere, are useless with greenheart. The *Syrophanician* received for freight 1s. 6d. $\frac{1}{2}$ cubic foot by callipers; a load is 50 cubic feet. **Port charges**, viz. :—tonnage dues, \$54 60c.; harbour master,

* In 1866, the duty on timber being abolished, the measurement was undertaken at several of the principal ports by the Bill of Entry Office, Her Majesty's Customs.

\$14 56c. ; governor, secretary, and sheriff, \$7 33c. ; total, \$76 49c. **Pilotage** 10½ feet inwards, 16 feet 7 inches outward, \$93. With ordinary care, the Essequibo is not considered unhealthy for the crew of a ship ; sleeping on deck by night, even under an awning, will induce sickness. Temperance both in eating and drinking must be observed, and a certain amount of energy should be exercised to prevent that lassitude usually brought on by the climate, and which is the commencement of fevers. The seasons are not regular ; long wet season May, June, and July ; short wet season November, December, and January ; short dry season February, March, and April ; long dry season August, September, and October.

1213. **Greenheart** varies in weight per foot. Demerara 66 lbs. 3 ozs, cedar 32 lbs., larch 45 lbs., Riga fir 48 lbs. 12 ozs., elm 66 lbs. 8 ozs., beech 60 lbs., and ash 58 lbs. 3 ozs. These are fair averages of green timber. The tape measure is 10 ¢ cent. less than calliper.

1214. **Railway sleepers** for Kurrachee and other parts of India, weigh usually 140 to 144 lbs. each ; see dangerous goods. Railway sleepers are sometimes freighted by the linear foot. 11 feet 11 inches go for 11 feet only, and thus less than 12 inches goes free. A master, March, 1865, loaded a full cargo of **creosoted half-round sleepers** in London for Lisbon, the bills of lading were presented to him for 6,946 pieces of timber, 9 feet by 9 inches by 4½ inches, equal to 288 loads. His calculation gave 351 loads, but he could not maintain it, because the charter-party being executed in England, the clause "per load of 50 cubic feet Customs' measurement" meant English Customs' measurement, which was produced by multiplying half the girth of the circular part by the perpendicular height, and the product by the length, and divide by 144, the contents to be computed to the tenth of a cubic foot.

1215. **East Indies.** It is usual where Peengado, Pedowk, and Teak timbers are laden at the same port, to take a portion of each, as the vessel will then stow a larger cargo than she possibly could if made up of Peengado and Pedowk only. From the time a teak tree, which will yield timber fit for Admiralty or gun-carriage purposes, is first girdled in the forest, three years are necessary to kill and season it sufficiently to admit of its being dragged to the water's edge and floated to its destination. Timber in Pegu or Tenasserim is always moved by water ; or when moved on shore it is invariably dragged by elephants.

1216. Ships laden with **Teak** do not carry very much more than their register tonnage ; small ships are unprofitable ; in an ordinary well-carrying ship 50 cubic feet of Moulmein teak requires about

57 feet of space, and weighs 22 cwt. Some kinds of teak are so heavy that they will soon sink, and by the rules of the port at **Moulmein** the ship is required to weigh up that which goes down alongside; care must, therefore, be taken when casting rafts adrift to see there are no sinking pieces among them. For exportation it is all sawn and squared—not equal sided. **Rangoon** teak is considered better than Moulmein. Teak was divided in 1848 into three classes; first class all above 25 feet long, second 20 to 25 feet, third all under 20 feet; the limits of the first class have since been reduced to 24 feet; the different classes paid proportionate rates. All under 9 inches is called plank, which forms a large proportion of the cargo. Teak is freighted by the load of 50 cubic feet; it is frequently penetrated by a worm or shell-fish; the worm-holes are usually plugged with soft wood by ship-builders as they proceed. In the article rice there is some information about Moulmein.

1217. **New Zealand** Khauri spars, hitherto imported principally for Admiralty purposes, are found only in the Auckland or northern province, and are shipped almost entirely from Hokiangu and Kaipara, two river harbours on the north-west coast. They are generally from 50 to 100 feet in length, by 20 to 30 inches diameter. The loading is tedious. Large ports are absolutely necessary, and not unfrequently beams have to be cut and the masts taken out. Experienced stevedores may generally be obtained, but they require the watchful superintendence of the master or mate. Tackle for hauling in and stowing can be borrowed, but as the charge is generally high, powerful purchases, chains, hooks, &c., had better be provided beforehand. Timber over 40 feet in length usually receives double freight without reference to diameter. As only half rates are allowed for short timber, careful computations of stowage should be previously made. In other respects the advice regarding North American cargoes is applicable to khauri spars.

1218. **Puget Sound.** In Puget Sound, Oregon, the Mill Company at Port Gamble, have an excellent contrivance for loading long heavy spars. The ship is laid end on to a break or opening at right angles with the wharf; a derrick over the bow lifts the near end of the spar, while the outer end is supported by a movable crane, the wheels of which traverse on iron rails laid each side of the opening. A tackle from the ship rigs the spars in and pulls along the crane, which has an elevated platform provided with machinery for raising or lowering the outer end, to suit the convenience of the stowers in the hold. When hauling in long spars, great care must be observed to prevent the outer gear from slipping or giving way; for want of

this precaution ships have been greatly injured. Instances have occurred, when the outer end has fallen, that the inner end has caught the hold beams and carried them away.

1219. **Vancouver Island** lies between the parallels of $48^{\circ} 20'$ and 51° N. lat. and from 123° to 128° W. lon. It is of an elongated oblong form, about 300 miles in length with a breadth of 30 to 50 miles, and is separated from the main land by various sounds, channels, and straits, from two to twenty miles wide. In these intermediate seas there are many lesser islands. The climate is like that of Devonshire.

Rains are frequent from 15th November until April; in March winter begins to disappear. Vegetation is at the highest in June and July; August and September are dry. In summer the prevailing winds are S.W. to N.W. During August, September, and October, there are two high and low waters in the 24 hours; in November, December, and January, the 12-hour tide occurs; in February, March, and April, there are two tides, the superior high-water occurring from one hour to three hours p.m.

The **products** of British Columbia are coal, timber, gold, fish, fish-oil, &c. Coal is raised from the mines of Nanaimo on Vancouver shore, exactly opposite Burrard's Inlet. It answers well for steaming purposes, can be had for 30 to 35s. \textsterling ton, is lighter by 10 \textsterling cent. than Welsh coal, the consumption being proportionately rapid. Specific gravity 1.24; carbon 66.93; hydrogen 5.32; nitrogen 1.02; sulphur 2.20; oxygen 8.70; ash 15.83. Large quantities are sent to San Francisco; freight about \$4.80 \textsterling ton.

In June, July, and August, salmon abound, and can be obtained in a lesser degree all through the winter; the price of a 15 lb. salmon in the height of the season at Victoria is 1s. 6d. Cod and herring are also very numerous.

The chief economical woods are the oak and the Douglas pine or yellow fir, which is sometimes 150 feet long, and can be squared 45 inches for 90 feet; it makes excellent timber; this is *the* tree of the colony, and is by some called Oregon red pine. It grows abundantly over the whole colony. There are saw mills on the island, and two also at Burrard's Inlet on the main.

Burrard's Inlet is about 80 miles north of Victoria; it is a port of entry. The inlet never freezes over; when ice is formed it is not sufficiently thick to impede navigation. To supply the mills, lumber men proceed into the forest all the year round, and cut down the larger trees, which are then pared and thrown into the water, where they are taken in charge by steam-tugs, and towed to the mills. The specific gravity of the timber, when dry, is about the same as Memel

deals, but if the lumber is cut when the timber is green it weighs heavier.

Regarding the navigation to Burrard's Inlet, Capt. S. MACLEAN, of the barque *Barsillai*, in writing to Messrs. FRIEDLANDER and Co., San Francisco, 16th November, 1867, says: "My passage occupied seven days to Fuca Straits and seven to Burrard's Inlet. I stopped nowhere and did not employ a steam-tug or pilot. My cargo consists of 400,000 feet. The harbour is safe and inexpensive." Capt. ALBERT MORIK, of the Swedish brig *Sidon*, writing to Mr. SPEYER, San Francisco, under date 16th May, 1868, says: "The navigation up here is not worse than in many other places, and it is not necessary to employ a tug-boat." Capt. WM. J. LOOE, of the ship *Chelsea*, writes under date 31st July, 1868, to Messrs. S. P. MOODY and Co.: "We were 14 days from San Francisco to Victoria, and three days thence to Burrard's Inlet. Having loaded last year at Puget Sound I find that my expenses do not amount to one-third of what they were there. The crews here are free from the temptation of a grog-shop and no idlers are allowed about this place."

The standard thickness of the lumber is one inch, but other thicknesses are supplied to order. T. and G. flooring is prepared, among other descriptions from 1 × 4 inch to 1 × 6 inch, under 36 feet long. Timber is sold at per mille super (*i.e.* 1,000 superficial feet of 1 inch in thickness) equal to 83·4 feet cube. Owing to its softness and the facility of working it, this lumber commands a ready sale. Even at San Francisco, where there was an import duty of 20 ¢ cent. in 1868, it competed successfully with lumber from the Puget Sound mills. Hundreds of vessels are employed between San Francisco and Puget Sound and Burrard's Inlet, in the timber trade.

Vessels lay alongside the wharf, where they are undisturbed by either the tides or the weather, perfectly safe. MOODY has two mills, a steam and water power mill, capable of cutting 80,000 feet per 24 hours; when necessary they work night and day. Stevedores can be employed at the mills for \$5 ¢ day. Ship's crew stow the cargo under the stevedore's supervision. Lumber taken from the wharf. Spars from the water or a lighter. Crab-winch or a steam-engine, when on board, generally used in taking in spars. Tonnage dues 2d. ¢ ton register in, and the same out. Pilotage \$7 ¢ foot; pilots can be had either at Victoria or English Bay. Steam-tugs, when desired, can be obtained at Victoria or Burrard's Inlet at from \$300 to \$400 for towage from Victoria to the mills and back to Victoria. Ballast can be thrown out in the inlet. No wharfage dues to pay.

A firm which has had much experience in the timber trade, adds

—as regards stowage, vessels laden with an assorted cargo of sawn lumber, can be loaded quite full, and generally carry a deck-load. Spars are usually hewn eight-sided and usually make excellent stowage and a buoyant cargo. Masters can purchase to advantage firewood, &c., for beam fillings. Spars are floated alongside, and, unless very large, can be taken in with a 2½-inch purchase fall. The mode of loading these spars is (to describe it generally) to raise them on floats of some sort to a level with the port, end on, and haul them in with a double purchase-block. The ships are discharged at home in a similar way by hauling the spars out at the ports on to lighters level with the port, from which they are toppled into the water, after they are clear of the port. The disbursements of a ship loading a cargo of spars range from 7s. 6d. to 10s. 4d. per ton register.

In May, 1868, there were in Burrard's Inlet about ten large ships, averaging 800 tons, taking in cargo for California, Peru, and Chili, and for the Sandwich Islands and Australia. Their hold filled from the ceiling to the deck beams; the odd spaces caused by the mats, &c., were occupied with the ends and slabs of the spars, which were also used for dunnage where necessary, and were ultimately sold for firewood. Most of these ships carried lumber on deck, from stem to stern, stowed flat and as high as the bulwarks, against which stanchions were fitted to receive lines so as to form artificial bulwarks. The deck lumber was on spars opened to preserve a waterway to the scuppers. The deck-laden ships were of course very deep.

Provisions can be obtained at Burrard's Inlet from Victoria. Fish abounds, particularly salmon, outachan, and smelt. The water can be easily procured in boats and casks; it is supplied free of toll by iron pipes from a natural lake about half a mile distant from the steam mills. There is postal communication twice a week between Victoria and New Westminster, and once a month by the mail steamer to San Francisco. The telegraph is extended to Victoria, Vancouver's Island, and to New Westminster, on the main land. Currency is in the American dollar \$4·84 to the English sovereign.

Vessels bound for Nanaimo, Sooke, Burrard's Inlet, &c., can obtain **pilots or steam-tugs** at Royal Roads, close to Victoria. If bound to Burrard's Inlet they proceed through the Gulf to English Bay (three miles broad), a very excellent anchorage just outside Burrard's Inlet, which consists of two inlets, one inside the other, the outer one is approached by a narrow passage; the inner communicates also by a narrow passage. It is almost impossible for a stranger to navigate the two straits without a leading wind, and it is

usual to employ steam-tugs belonging to one of the mills, and which are generally engaged beforehand, at Royal Roads, where they frequently commence this duty.

Ships reach Victoria and adjacent ports from the Pacific by the Straits of Juan de Fuca, which lie between the parallels of $48^{\circ} 23'$ and $48^{\circ} 36' N.$; they are 13 miles wide at the entrance, and 40 miles long. The south side of the Straits belongs to the United States and is lighted. There is also a lighthouse on the North side at Race Rocks, 50 miles from the entrance. Ships proceed direct to Royal Roads, at the entrance of Esquimault harbour, where, if a vessel is bound beyond Victoria, a pilot should be obtained for navigating the narrow waters and strong currents which prevail in the Haro Canal, and the Rosario Straits, leading into the Gulf of Georgia.

The prevailing **summer wind** in the straits of Georgia, is from N.W. or the same as on the outside coast, and between May and September it blows strong and steadily, commencing about 9 a.m., and dying away towards sunset. These winds do not generally extend much below Point Roberts. Among the Haro Archipelago they become variable and baffling, while in the main channels of Rosaria and Haro, the westerly wind entering the Straits of Fuca, is deflected to S.W., and vessels running up these channels with a fair wind will almost always find it ahead on entering the Straits of Georgia. During winter there is a good deal of moderate, calm, and gloomy weather, but gales from S.E. and S.W. are frequent.

Victoria is the capital of the whole colony of British Columbia, which includes the main land of British Columbia and also the island of Vancouver. It is at the south extremity of the island and has two harbours, Victoria and Esquimault, the latter being the westward one.

**VICTORIA AND ESQUIMAULT HARBOUR DUES, 1880, for
Entering and Clearing Vessels. (*May have been altered.*)**

Under 15 tons	... £0 4 2	400 to 500 tons	... £1 13 4
15 to 30	... 0 6 3	500 600	... 2 1 8
30 50	... 0 8 4	600 700	... 2 5 10
50 100	... 0 12 6	700 800	... 2 10 0
100 200	... 0 18 9	800 900	... 2 18 1
200 300	... 2 14 2	900 1000	... 3 2 0
300 400	... 1 5 0	1000 and upwards	... 3 6 8

All steamers, *bona fide*, carrying mails, to pay half the amount of the above scale of fees, according to their tonnage.

LANDING PERMITS FOR INVOICES.

Under 10 tons	£1 0 0	30 to 50 tons	£3 0 0
10 to 30 tons	2 0 0	50 and upwards	4 0 0

HALF-YEARLY LICENSE FOR COASTERS.

Under £100	£0	4	2	500 and under 1000 ...	£0	12	6
100 and under 250	0	6	3	1000	0	16	8
250 and under 500	0	8	4				

Orders for coal, lumber, &c., of the colony are executed at Victoria, by Messrs. SPROAT and Co., whose correspondents in London are ANDERSON, ANDERSON, and Co. It is not customary to send orders direct to the coal mines or saw mills.

1220. The iron ship *Vigil*, Capt. PRINCE GILPIN, belonging to Messrs. POTTER BROTHERS, of Tower Buildings, Liverpool, took in 361,133 superficial feet of lumber at **Burrard's Inlet**, in 1869, sailed in April, and discharged the same at Callao in July and August. The ballast consisted of 212 tons stone, on which slabs one inch thick were placed athwartship. After the ground tier was laid the loading was continued fore and aft, commencing from the wings; all the cargo in the hold was sent down the main hatchway; it consisted of 346,085 superficial feet of lumber *with* about 7,300 feet of short lengths for broken stowage being less than 15 feet long. On deck there were 15,048 feet super. The *Vigil* registers 550 tons, is 163'9 feet long, 27'2 broad, 18'1 deep; beam to deck 6 feet 2 inches. So laden she drew (with all her stores on board) 16 feet 10 inches aft, and 16 feet 6 forward; with a dead-weight cargo of 750 tons of nitrate of soda, taken in at Iquique, 16 feet 10 inches aft, 16 feet 8 forward; her best trim at sea is 16 feet on an even keel. Her **port charges** at Burrard were about \$44 (£9); **pilotage in**, from Victoria to Moody's mill \$7 ½ foot. The specification of this cargo, as per margin on the bill of lading, was as follows:—

Tongued and grooved lumber.—1 × 6—6,554 pieces=72,772 feet.

Plain lumber boards, quartering, &c.—Of various lengths, none shorter than 15 feet:—

THICK.	BRD.	PIECES	FEET.	THICK.	BRD.	PIECES.	FEET.
1	×	12	1896	3	×	10	128
1½		12	220	3		12	389
2		3	1892	4		4	528
2		4	401	4		6	363
2		10	252	4		10	148
2		12	385	4		12	267
3		3	716	6		6	69
3		4	684	6		8	28
3		5	233	6		10	14
3		6	331	6		12	47
3		8	119				
3		9	83				
			4486	Total below deck			346,085

Also 7,300 feet Broken Stowage.

Deck load—plain lumber.

THICK.	BRD.	PIECES.	FEET.	THICK.	BRD.	PIECES.	FEET.
8	× 8	42	6896	4	× 12	1	116
10	12	8	2810				
12	12	8	3504		On deck	.....	15048
10	10	5	1500		Below	.....	346085
3	12	3	222				
					Total	.....	361,133

The deck-load was secured by pieces eight inches square across the lumber, shored down from the main rail. 30,000 to 40,000 feet of lumber, loaded down a hatchway of the ordinary size and in a ship not constructed for this trade, is considered a fair-day's work. Some of the coasters do as much as 70,000 or 80,000 ft^3 day. The stevedore's charges are \$5 ft^3 day when working day work. By the lump \$1 80c. to \$2 ft^3 1,000 feet, finding all labour and provisions for same, himself living in the cabin. So laden, the *Vigil* might have gone round the Horn; vessels with small deck-loads of spars frequently do so. An iron ship will generally stow one-third less than her register tonnage, *i.e.* ft^3 1,000 feet = 550 tons register one-third less = 367,000 feet of lumber.

1221. **Pages.** Every cargo, as imported, is entered in a book, each page of which contains 20 numbered logs, and each page is a lot in a sale. If the 20 logs average each 60 feet of timber, the lot is a 1,200-feet page; if 50 feet a 1,000-feet page, and so on. The higher the figure then the larger the timber.

1222. **Intake Measurement.** A master signed a bill of lading for a certain number of deals and deal ends shipped, the charter-party stipulated that the freight was to be payable on the intake measurement at St. Andrew's, N.B.: on discharging at Bristol, there proving to be a deficit of deals and an excess of deal ends—held that freight was due on the measurement in this country of the cargo landed. No proof having been given of the intake measurement, master held liable for any deficit of cargo. *Mary Annah.*

1223. **Freight.** Queen's Bench, 15th January, 1867. Before the LORD CHIEF JUSTICE, Mr. Justice BLACKBURN, and Mr. Justice SHEE, and Mr. Justice LUSH. This was an action by ROBINSON, shipowner, against MACKAY, consignee, to recover freight and damage for trespass. The ship brought a cargo of timber; by the charter-party "the usual custom of the port of Liverpool was to be observed when the charter was not explicit." When the ship arrived, the consignees claimed to measure the cargo to ascertain the amount of freight, according, as they alleged, to the custom of the port of Liverpool. This was disputed by the plaintiff, who proposed a joint measurement. This, however, was refused by the consignees, who insisted upon the sole right of measurement, the owner paying half their

charges. In vain the plaintiff urged that he should be enabled in some way to join in the measurement so as to satisfy himself that it was correct; and when people came to take part in the measurement they were roughly and forcibly excluded by a formidable set of fellows called "lumpers," who forcibly excluded plaintiff from his own ship, and refused to let him see the measurement of her cargo. The dispute continued for some weeks, in the course of which a great part of the freight, amounting to some thousands of pounds, was paid, but there being a dispute as to the sum remaining due, and especially as to the defendants' right to deduct the sum of £52, half their charges for measurement; in the result, the defendants, by their "lumpers," took forcible possession of the cargo, which was the trespass complained of, by which it was complained the plaintiff lost his lien upon the goods for the remainder of the freight. In the present action the defendants paid into court the sum remaining due according to their measurement, *minus* the sum of £52. At the trial, before Mr. Justice BLACKBURN, at Liverpool, defendants set up the custom, and a special jury of merchants found it as a fact. The learned judge, however, thought that there was no evidence that the forcible exclusion of the plaintiff from the ship was by authority of the defendants, or that there was any substantial damage either by the trespass in taking the goods, or detaining the ship, inasmuch as the dispute was only as to a lien; and the real question was as to the amount of freight due; and, according to the custom, there was no freight due beyond what was paid into court. The point was not taken that as this was after action, and not the time of action, the plaintiff was entitled to the goods; he was entitled to recover the balance of the freight, as damages for the loss of his lien on the count for trespass.

The jury found for the plaintiff for a farthing on the trespass count, and for the defendants as to the rest of the claim.

Mr. QUAIN (with him Mr. C. RUSSELL) now moved on the part of the plaintiff for a rule to enter the verdict for him for the whole amount of the freight remaining due, or to enter it for the sum of £52 upon the count for freight; and for a new trial on the ground of misdirection by the judge, or miscarriage of the jury. He insisted that the plaintiff was entitled to recover substantial damages both for the trespass and the detention. The taking of the goods, deprived the plaintiff of his lien, and thus of the means he possessed of enforcing the payment of the full amount of the balance of the freight, and, therefore, this was what he had lost, and was entitled to recover for the trespass. Then, the detention was caused by the defendants' exclusion of the plaintiff from his ship, and the delay caused in the discharge of the ship by the dispute arising out of this unfounded claim. On the main point of the case—the alleged custom—he urged that it could hardly have been of any standing, seeing that before the abolition of the duty on timber the cargoes were measured by the custom-house officers: so that the supposed custom was pretty recent. But it was to the last degree unreasonable and absurd, because it violated the first principles of justice, making men virtually judges upon their own claims. The consignees were to pay the freight, and they were to ascertain the amount. The shipowners, who were to receive the freight and had a lien on the cargo on their own ship, were not to be allowed to join in the measurement, and were to have no means of checking it, or securing its correctness. Such a custom, he urged, was monstrously unreasonable and essentially unjust.

In the course of the discussion, Mr. Justice BLACKBURN observed that he did not understand the custom to come to this, that the shipowners were to have no

opportunity of ascertaining the correctness of the measurement, but that the consignees were to make the measurement, and the charges borne by both parties. He did not think that there was sufficient evidence that the defendants' authorised the "lumpers" to exclude the plaintiff from the ship.

After some discussion and consideration, the LORD CHIEF JUSTICE said the Court did not think that the plaintiff was entitled to a verdict for substantial damages on the trespass count, as it was only a matter of lien; but on the other points, as to the validity of the alleged custom, and as to the detention, the learned counsel might take a rule *nisi*.

1224. Ballast—Deck Load. At Liverpool, 19th December, 1864, before Mr. Justice BLACKBURN, *CROW v. ARMSTRONG*. In February plaintiff chartered defendant's vessel the *Armstrong*, to load at Baltimore a full and complete cargo of lawful merchandise, estimated at 1,200 tons. There was also a provision that if loaded with timber she should carry a deck-load if required, provided the surveyor assented. After discharging, the master proposed to take in 125 tons ballast, but plaintiff's agent advised only 75 tons. She then took in 1,080 tons of oak, but was so tender that the master refused to take more than six logs on deck. The action was for the difference between 1,200 tons by charter and 1,080 tons loaded. Verdict for plaintiff £187, to be reduced to £75 if defendant was right that the 75 tons of ballast was to be considered as part of the 1,200 tons of cargo. In the Common Pleas, 8th May, 1865, before Justices ERLE, BYLES, KEATING, and SMITH, a rule having been obtained for a new trial on the ground of misdirection, the LORD CHIEF JUSTICE was of opinion that the rule should be made absolute. It appeared to him that there was evidence which constituted a defence to the action under the pleas. The action was brought against a shipowner by a charterer for not taking a sufficient load, the cargo being timber, the reason being that instead of 125 tons he had only 75 tons of ballast on board. On the part of the defendant the captain had proposed to put 125 tons on board, but by the direction and at the request of the agent of the charterer he only took 75 tons, and on that account he was not able to carry so great a deck-load. The captain was bound to make the ship ready for any description of merchandize, but the evidence did not show conclusively that the captain had omitted to do this. The cargo might be oak timber, requiring but little ballast; or it might be squared timber, which would be like dead-weight; or it might be crooked and mixed timber, and not closely packing, and therefore require more ballast. The shipowner could only act accordingly, as he was advised by the charterer what the cargo would be, the amount of ballast not being a fixed quantity; and on the facts as found on the trial it seemed that the shipowner had so acted, and that there was a defence to the action, which might properly be raised under the pleas pleaded. The other learned judges were of the same opinion. Rule absolute.

1225. Alleged Breach of Contract. Timber cargoes from Havannah. *COOK v. MEEK*. Before Lord Chief Justice ERLE, 22nd December, 1863. The plaintiff was a shipowner, and in July, 1861, the defendant chartered of him a vessel to proceed to Havannah and load a complete cargo of merchandize for England. At Havannah so many logs of mahogany as the ship would hold were received, but of course with a cargo of that kind there was much vacant space (30 tons), which plaintiff contended should have been filled with broken stowage, carried according to custom, at half-freight. The principal question in the case was, "whether a full and complete cargo of timber" meant that after the timber had been put on board, the remaining space should be filled with broken stowage,

and upon this question evidence was given *pro* and *con* by gentlemen conversant with the trade. The jury ultimately found for the plaintiff.

1226. Customs' Measurement. At Hartlepool, 8th November, 1857. *Alma*. Judge STAPLYTON decided that, according to the charter-party, plaintiff was to be paid so much per load for freight of timber—quantity to be ascertained by "Customs' calliper." The greater part of the cargo, however, consisted of lathwood, and was measured in bulk. The difference in freight was stated by a witness, who had measured the whole to be £25. Judgment for plaintiff, £9 11s. 11d., with costs. [In some docks, when receiving cargo, the fractional parts are not counted, thus, where the exact measurements of Norway timber are $3\frac{1}{2}$ thick by $11\frac{1}{2}$ wide, others $2\frac{1}{2}$ by $7\frac{1}{2}$, they are taken as 3 by 11 and $2\frac{1}{2}$ by 7. This contingency should not be forgotten when chartering.]

QUANTITIES PROPORTIONED to a KEEL OF 850 CUBIC FEET.

Description.	Gross.
	tons.
17 loads Baltic squared fir	18½
17 — North American squared fir.....	13½
17 — Birch	22
14'923 loads masts, round	17½
5'1515 stand. hund. deals, 120 pieces, 12 ft. 11 in. 1½ in.	17
4'857 ————— battens, 120 pieces, 12 ft. 7 in 2½ in.	17½

1227. Tonnage. A load of square timber 50 cubic feet ; rough 40 feet. A vessel of 365 tons will carry 483 loads or 132 standard hundred, 10 pieces deal. One hundred (120) St. Petersburg standard deals are reckoned for freight as being equal to 3 loads timber. Mahogany 48 feet to the ton of 20 cwt. ; London Docks, 45 feet ; at Belize, 47 and sometimes 50 feet. Teak, 50 cubic feet make a load. Greenheart and Morra are freighted at per cubic foot. Bengal and Madras ton planks and deals 50 cubic feet. Bengal and Bombay ton round timber 40 feet ; hewn 50 cubic feet. Bombay ton teak, square planks and poon, 50 cubic feet. New York 20 cwt. ; Nicaragua wood and all heavy dye woods ; and 40 cubic feet mahogany, square timber, oak plank, and other boards. At New York 20 cwt., Jacaranda logs ; at Bahia 23 cwt. At Baltimore, 2,240 lbs., logwood, fustic, and other heavy dye woods, and 2,000 lbs. ; Nicaragua and Braziletto wood, and 40 cubic feet plank, boards, and timber. In measuring a log of timber 40 feet long, a *tape* measure may expand two or three inches, and may therefore be objected to as a just measure for settling a dispute.

To reduce the Quebec standard deals into the Petersburg standard, multiply the Quebec by 3 and divide by 5.

The Petersburg standard hundred, being 120 pieces of 12 feet long, 11 inches broad, by $1\frac{1}{2}$ inch thick, 100 Quebec standard deals are equal to 1 hundred 1 quarter 16 pieces of Petersburg standard deals.

100 Petersburg standard deals equal to	60 Quebec standard
120 Ditto	72 Ditto
36½ Ditto	1 Load

2750 superficial feet of plank, 1 inch thick, are equal in cubical contents to 100 Quebec standard deals.

20 Deals, 12 feet 11×3 , are generally taken as equal to one load of pine of 50 feet, though in reality equal to 55 feet cube.

TIMBER—Sorts, Sizes, and Freights. Timber is divided into three sorts :

Square, the full size of the tree having only its sides squared off ;

Thick stuff, square timber cut into different thicknesses from $4\frac{1}{2}$ to 10 inches, but the whole depth of the tree, and

Plank, which runs from 4 down to $1\frac{1}{2}$ inches ; all under is called *board*.

BALK LOGS : hewn or sawn squared timber, 8 inches square and upwards.

BATTENS : pieces of sawn wood $6\frac{1}{2}$ or 7 inches wide, and $2\frac{1}{2}$ inches and under in thickness, and 8 or more feet long.

BOARDS : all widths, $1\frac{1}{2}$ inches, some say 2 inches thick.

DEALS : pieces of sawn wood 10 feet long and upwards, above 7 inches wide, and from $1\frac{1}{2}$ to $3\frac{1}{2}$ inches thick, and upwards. One hundred Petersburg standard deals contain 165 cubic feet, equal in measurement to $3\frac{1}{6}$ loads—calculated for freight at 3 loads.

1 standard hundred deals contains... 1,980 inches.

3 loads timber 1,800 —

Difference 180 inches, or 10 per cent.

DEALS, STANDARD. The following are the foreign and colonial standards :—

Description.	Long.	Broad.	Thick.	Size.
	ft.	in.	in.	ft. in. pts.
Russia and Prussia.....	12	11	$1\frac{1}{2}$	1 4 6
Sweden	14	9	3	2 7 6
Norway	12	9	3	2 3 0
Christiana, &c.	11	9	$1\frac{1}{2}$	0 8 5
Dram	10	...	$1\frac{1}{2}$	...
Quebec	12	11	$2\frac{1}{2}$	2 3 6

ENDS : Deal or Batten Ends for broken stowage pay two-thirds freight of deals.

A deal end is 8 feet or under, and no greater length can be insisted on, unless by special agreement.

FIREWOOD : a fathom is 6 feet wide, 6 feet high, and 6 feet long.

LATHWOOD : 1 fathom 4 feet long, 6×6 , is equal to 3 loads of timber nearly.

LOAD squared timber 50 cubic feet, rough 40 cubic feet. Three loads squared are equal to 1 standard hundred deals in paying freight ; see above.

MASTS, round, 33 feet girt measure, equal to one load fir timber of 50 feet. Custom-house calliper measure.

PLANK is 11 inches wide and upwards, by $1\frac{1}{2}$ inches thick and upwards.

Fir and oak plank equal to a load of timber : 2,200 feet of half-inch, 600 one-inch, 400 one and a half, 300 two, 240 two and a half, 200 three, 150 four, 120 five, and 100 of six-inch.

SCANTLING : dimensions given for timber, plank, &c., also all quartering under five inches square ; all above that size is called carling.

STOWAGE, BROKEN : a fathom of 4-feet lathwood, though equal to nearly three loads, receives only freight equal to one load of fir timber ; deal ends two-thirds. The freight of deals, staves, and other broken stowage to be subject to a special agreement.

THICKSTUFF : a name for sided timber exceeding 4 inches, but not being more than 10, some say 12 inches in thickness.

WAINSCOT LOGS pay one-third more (i.e. 6d. to 3s.) than freight of timber per load of 50 cubic feet calliper measure ; some say by special agreement. Half-logs for broken stowage pay two-thirds freight of whole logs.

WOOD, A CORD, for fuel, is a pile 8 feet long, 4 high, and 4 broad (128 cubic feet), weighing say half a ton ; in some places it is 1,000 billets or 4 loads. An *Admiralty* cord is 128 cubic feet, and weighs 1,700 lbs., same as at New York ; $8 \times 8 \times 4$. In Austria $88\frac{1}{2}$ cubic feet.

SHAKEN or SHAKY : a natural defect in plank or timber when it is full of splits or clefts, and will not bear fastening or caulking.

CHAMFERING or camfering : the operation of taking off any angle or edge.

DRUXEY : a state of decay in timber with white spongy veins—the most deceptive of any defect.

DUB : to reduce the size of timber.

TASTING of plank or timber : chipping it with an adze, or boring it with a small auger, for the purpose of ascertaining its quality or defects.

QUEBEC TIMBER.

Extracted from PARADIS' Ready Reckoner, published at Quebec, 1837.

Description.	Size.
	ft. in. pts.
1 Quebec standard deal.....	2 3 6
100 ditto .....equal to.....	229 2 0 or $4\frac{1}{2}$ loads
240 ditto —	550 0 0 or 11 —
1 load — 21 deals	1 10 6 [stand. deal
1 Petersburg do. —	1 4 6 or 3-5th Quebec

BALTIC TIMBER.

DEALS. A standard deal from **Christiana** and the southern ports of Norway, except **Dram**, is 11 feet long, $1\frac{1}{2}$ inch thick, and 9 inches wide. Dram deals being nearly one-eleventh part less, the freight should be proportionate.

[Where two ships have been in company, going up, one has loaded cargo, and sailed from Christiana before the other has got over *Dram Stroom*, which runs down very strongly in the spring.]

DEAL ENDS, four, although each 6 feet long, make but a deal 16 feet long; as freighters seldom wish for deal ends, which run generally from 5 to 8 feet, and are taken as broken stowage for ship's advantage, she bears the burthen.

BATTENS, six ends, called *Larwick palings*, are counted a standard deal.

OAK PLANK is assorted at **Dantzic** the same as staves, which see. Crown plank in the middle is marked C, brack in the end and middle B, and bracks brack BB.

To distinguish $1\frac{1}{2}$ from 2, and $2\frac{1}{2}$ from 3 inches, $1\frac{1}{2}$ is marked I, $2\frac{1}{2}$ with a cross.

STANDARD DEALS at **DRAM**, 11 feet by $1\frac{1}{2}$ inch, contained in deals from 12 to 20 feet long, and $1\frac{1}{4}$ to 3 thick, calculated to the 60th part of a deal :

20	1½-inch.	2-inch.	2½-inch.	3-inch.
ft. long.	deals. pts.	deals. pts.	deals. pts.	deals. pts.
12	24 0	32 0	40 0	48 0
13	26 0	34 40	43 20	52 0
14	28 0	37 20	46 40	56 0
15	30 0	40 0	50 0	60 0
16	32 0	42 40	53 20	64 0
17	34 0	45 20	56 40	68 0
18	36 0	48 0	60 0	72 0
19	38 0	50 40	63 20	76 0
20	40 0	53 20	66 40	80 0

DANTZIC DEALS (cut 12 inches broad) reduced to Loads, Feet, and inches :

20	2-inch.	2½-inch.	3-inch.
long.	load. ft. in.	load. ft. in.	load. ft. in.
18	1 10 0	1 25 0	1 40 0
24	1 30 0	2 0 0	2 20 0
30	2 0 0	2 25 0	3 0 0
36	2 20 0	3 0 0	3 30 0
40	2 33 4	3 16 8	4 0 0

STANDARD DEALS, 11 feet long by $1\frac{1}{2}$ inch thick, at CHRISTIANA, and all the southern ports of Norway except Dram, contained in deals from 9 to 20 feet long, and from $1\frac{1}{2}$ to 4 inches thick, calculated to the 55th part of a deal, and reduced.—*Baltic Master's Assistant.*

20	1½-inch.	1½-inch.	2-inch.	2½-inch.	3-inch.	4-inch.
ft. long.	deals. pts.	deals. pts.	deals. pts.	deals. pts.	deals. pts.	deals. pts.
9	16 20	19 35	26 10	32 40	39 15	52 20
10	18 10	21 45	29 5	36 20	43 35	58 10
11	20 0	24 0	32 0	40 0	48 0	64 0
12	21 45	26 10	34 50	43 35	52 20	69 45
13	23 35	28 20	37 45	47 15	56 40	
14	25 25	30 30	40 40	50 50	61 5	
15	27 15	32 40	43 35	54 30	65 25	
16	20 5	34 50	46 30	58 10	69 45	
17	39 50	37 5	49 25	61 45	74 10	
18	32 40	39 15	52 20	65 25	78 30	
19	34 30	41 25	55 15	69 5	82 50	
20	36 20	43 35	58 10	72 40	87 15	

STANDARD DEALS, 12 feet long by $1\frac{1}{2}$ inch thick, in RUSSIA, SWEDEN, and PRUSSIA, contained in deals from $1\frac{1}{2}$ to 3 inches thick, 10 to 20 feet long, and to the 54th part of a deal, are proportioned as under :

20	1½-inch.	2-inch.	2½-inch.	3-inch.
ft. long.	deals. pts.	deals. pts.	deals. pts.	deals. pts.
10	16 36	22 12	27 42	33 18
12	20 0	26 16	33 18	40 0
14	23 18	31 6	38 48	46 36
16	26 36	35 30	44 24	53 18
18	30 0	40 0	50 0	60 0
20	33 13	44 24	55 30	66 36

To find the cubical contents of timber : Multiply the breadth by the thickness, each in inches, and the product by the length in feet. Divide by 144 ; the remainder will shew the cubical contents, thus ; length of a piece of timber 20 feet, breadth 13 inches, thickness $12\frac{3}{4}$.

length. breadth. thickness.
20 ft. : 13 in. :: $12\frac{3}{4}$ in.

12¾
166
20
144)3320(23 cubic feet.
288
440
432
8

or in this way :

in. | 1' 3" 20 feet
1 | 1 8
2 | 1' 3" 21 8
| 1 4 3
23 0 3

TABLE for the CONVERSION OF DEALS, BATTENS, DEAL and

No. of DEALS.	21 feet—Deals.			20 ft.—Deals & Battens.			19 ft.—Deals & Battens.		
	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.
	STANDARD DOZEN.			STANDARD DOZEN.			STANDARD DOZEN.		
1	0'3	0'2	0'2	0'3	0'2	0'1	0'3	0'2	0'1
2	0'6	0'5	0'3	0'6	0'5	0'3	0'5	0'4	0'3
3	0'9	0'7	0'5	0'8	0'7	0'4	0'8	0'6	0'4
4	1'2	1'0	0'6	1'1	0'9	0'6	1'1	0'9	0'6
5	1'5	1'2	0'8	1'4	1'1	0'7	1'3	1'1	0'7
6	1'8	1'4	0'9	1'7	1'4	0'9	1'6	1'3	0'8
7	2'0	1'7	1'1	1'9	1'6	1'0	1'8	1'5	1'0
8	2'3	1'9	1'2	2'2	1'8	1'2	2'1	1'7	1'1
9	2'6	2'1	1'4	2'5	2'0	1'3	2'4	1'9	1'3
10	2'9	2'4	1'5	2'8	2'3	1'5	2'6	2'2	1'4
11	3'2	2'6	1'7	3'1	2'5	1'6	2'9	2'4	1'5
12	3'5	2'9	1'9	3'3	2'7	1'8	3'2	2'6	1'7
13	3'8	3'1	2'0	3'6	3'0	1'9	3'4	2'8	1'8
14	4'1	3'3	2'2	3'9	3'2	2'1	3'7	3'0	2'0
15	4'4	3'6	2'3	4'2	3'4	2'2	4'0	3'2	2'1
16	4'7	3'8	2'5	4'4	3'6	2'4	4'2	3'5	2'2
17	5'0	4'1	2'6	4'7	3'9	2'5	4'5	3'7	2'4
18	5'3	4'3	2'8	5'0	4'1	2'7	4'8	3'9	2'5
19	5'5	4'5	2'9	5'3	4'3	2'8	5'0	4'1	2'7
20	5'8	4'8	3'1	5'6	4'5	2'9	5'3	4'3	2'8
30	8'8	7'2	4'6	8'3	6'8	4'4	7'9	6'5	4'2
40	11'7	9'6	6'2	11'1	9'1	5'9	10'6	8'6	5'6
50	14'6	11'9	7'7	13'9	11'4	7'4	13'2	10'8	7'0
60	17'5	14'3	9'3	16'7	13'7	8'8	15'8	13'0	8'4
70	20'4	16'7	10'8	19'4	15'9	10'3	18'5	15'1	9'8
80	23'3	19'1	12'4	22'2	18'2	11'8	21'1	17'3	11'2
90	26'3	21'5	13'9	25'0	20'5	13'3	23'8	19'4	12'6
100	29'2	23'9	15'5	27'8	22'7	14'7	26'4	21'6	14'0
200	58'3	47'7	30'9	55'6	45'5	29'5	52'8	43'2	28'0
300	87'5	71'6	46'4	83'3	68'2	44'2	79'2	64'8	42'0
400	116'7	95'5	61'9	111'1	90'9	58'9	105'6	86'4	56'0
500	145'8	119'3	77'3	138'9	113'6	73'7	131'9	108'0	70'0
600	175'0	143'2	92'8	166'7	136'4	88'4	158'3	129'5	84'0
700	204'2	167'0	108'3	194'4	159'1	103'1	184'7	151'1	98'0
800	233'3	190'9	123'7	222'2	181'8	117'8	211'1	172'7	112'0
900	262'5	214'8	139'2	250'0	204'5	132'6	237'5	194'3	126'0
1000	291'7	238'6	154'7	277'8	227'3	147'3	263'9	215'9	140'0
2000	583'3	477'3	309'3	555'5	454'5	294'6	527'8	431'8	279'9
3000	875'0	715'9	464'0	833'3	681'8	441'9	791'7	647'7	419'8
4000	1166'7	954'5	618'7	1111'1	909'1	589'2	1055'6	863'6	559'8
5000	1458'3	1193'2	773'4	1388'9	1136'4	736'5	1319'4	1079'5	699'7

Extracted from Harper's Foreign Exchanges.

BATTEN ENDS, INTO ST. PETERSBURG STANDARD DOZEN.

No. of DEALS.	18 ft. Deals & Battens.			16 ft.—Deals & Battens.			6 ft.—Deals & Battens.		
	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.	Inches. 3 by 11.	Inches. 3 by 9.	Inches. 2½ by 7.
	STANDARD DOZEN.			STANDARD DOZEN.			STANDARD DOZEN.		
1	0'3	0'2	0'1	0'2	0'2	0'1	0'1	0'1	0'0
2	0'5	0'4	0'3	0'4	0'4	0'2	0'2	0'1	0'1
3	0'8	0'6	0'4	0'7	0'5	0'4	0'3	0'2	0'1
4	1'0	0'8	0'5	0'9	0'7	0'5	0'3	0'3	0'2
5	1'2	1'0	0'7	1'1	0'9	0'6	0'4	0'3	0'2
6	1'5	1'2	0'8	1'3	1'1	0'7	0'5	0'4	0'3
7	1'8	1'4	0'9	1'6	1'3	0'8	0'6	0'5	0'3
8	2'0	1'6	1'1	1'8	1'5	0'9	0'7	0'5	0'4
9	2'2	1'8	1'2	2'0	1'6	1'1	0'8	0'6	0'4
10	2'5	2'0	1'3	2'2	1'8	1'2	0'8	0'7	0'4
11	2'8	2'3	1'5	2'4	2'0	1'3	0'9	0'8	0'5
12	3'0	2'5	1'6	2'7	2'2	1'4	1'0	0'8	0'5
13	3'3	2'7	1'7	2'9	2'4	1'5	1'1	0'9	0'6
14	3'5	2'9	1'9	3'1	2'5	1'7	1'2	1'0	0'6
15	3'7	3'1	2'0	3'3	2'7	1'8	1'3	1'0	0'7
16	4'0	3'3	2'1	3'6	2'9	1'9	1'3	1'1	0'7
17	4'3	3'5	2'3	3'8	3'1	2'0	1'4	1'2	0'8
18	4'5	3'7	2'4	4'0	3'3	2'1	1'5	1'2	0'8
19	4'8	3'9	2'5	4'2	3'5	2'2	1'6	1'3	0'8
20	5'0	4'1	2'7	4'4	3'6	2'4	1'7	1'4	0'9
30	7'5	6'1	4'0	6'7	5'5	3'5	2'5	2'0	1'3
40	10'0	8'2	5'3	8'9	7'3	4'7	3'3	2'7	1'8
50	12'5	10'2	6'6	11'1	9'1	5'9	4'2	3'4	2'2
60	15'0	12'3	8'0	13'3	10'9	7'1	5'0	4'1	2'7
70	17'5	14'3	9'3	15'6	12'7	8'2	5'8	4'8	3'1
80	20'0	16'4	10'6	17'8	14'5	9'4	6'7	5'5	3'5
90	22'5	18'4	11'9	20'0	16'4	10'6	7'5	6'1	4'0
100	25'0	20'5	13'3	22'2	18'2	11'8	8'3	6'8	4'4
200	50'0	40'9	26'5	44'4	36'4	23'6	16'7	13'6	8'8
300	75'0	61'4	39'8	66'7	54'5	35'4	20'5	20'5	13'3
400	100'0	81'8	53'0	88'9	72'7	47'1	27'3	27'3	17'7
500	125'0	102'3	66'3	111'1	90'9	58'9	34'1	34'1	22'1
600	150'0	122'7	79'5	133'4	109'1	70'7	40'9	40'9	26'5
700	175'0	143'2	92'8	155'6	127'3	82'5	58'3	47'7	30'9
800	200'0	163'6	106'1	177'8	145'5	94'3	60'7	54'5	35'4
900	225'0	184'1	119'3	200'0	163'6	106'1	75'0	61'4	39'8
1000	250'0	204'5	132'6	222'2	181'8	117'8	83'3	68'2	44'2
2000	500'0	409'1	265'2	444'4	363'6	235'7	166'7	136'4	88'4
3000	750'0	613'6	397'7	666'7	545'5	353'5	250'0	204'5	132'6
4000	1000'0	818'2	530'3	888'9	727'3	471'4	333'3	272'7	176'7
5000	1250'0	1022'7	662'9	1111'1	909'1	589'2	416'7	340'9	221'0

Extracted from Harper's Foreign Exchanges.

TREENAILS—NUMBER AND SIZES OF PIECES TO A LOAD.

Pieces.	Length.	Pieces.	Length.
	inches.		inches.
5,333	9	1,777	27
4,000	12	1,600	30
3,200	15	1,454	33
2,666	18	1,333	36
2,285	21	1,142	42
2,200	24		

FIR AND OAK PLANK—NUMBER AND SIZES OF PIECES TO A LOAD.

Sup. feet.	Size.	Sup. feet.	Size.
	inches.		inches.
1,200	$\frac{1}{4}$	200	3
600	1	150	4
400	$1\frac{1}{4}$	120	5
300	2	100	6
240	$2\frac{1}{2}$		

TIMBER—ADMIRALTY TABLE.

TABLE of the weight of timber, green and seasoned, as used in the ships of war; it being also the data from which the weight of the timber materials is calculated in computing the ship's displacement at Devonport, 1832:

Cubic foot.	Green.	Seasoned.	Cubic foot.	Green.	Seasoned.
	lbs. ozs.	lbs. ozs.		lbs. ozs.	lbs. ozs.
English Oak.....	71 10	43 8	Cedar	32 0	28 4
Dantzic Oak	49 14	36 0	Larch	45 0	34 4
African Teak	63 12	60 10	Riga Fir	48 12	35 8
*Indian do., green } or seasoned	Malabar	52 15	NewEngl'nd do	44 12	30 11
about same..... }	Rangoon	26 4	Elm	66 8	37 5
Indian Mast Peon.	48 3	36 0	Beech	60 0	53 6
			Ash	58 3	50 0

* The Malabar teak is the heaviest and the Rangoon the lightest of all Indian teaks used in ship-building. The average weight of the timber materials in a ship or vessel of war is about 50 lbs. to the cubic foot, and for the masts and yards about 40 lbs.

SPECIFIC GRAVITY OF WOOD—TON OF 20 cwt.

Description.	Cub. ft.	Description.	Cub. ft.
Elm	53½	Ash and Dantzic Oak...	42½
Honduras Mahogany ...	56½	Spanish Mahogany ...	33½
Beech	42	English Oak	32½
Riga Fir	54½		

The specific gravity of timber varies not only according to the different sorts of the same kind, but according to the time which elapses after it is felled. The average weight at the period of shipment is of the most consequence to masters; the above table is calculated for that purpose. Additional information on weight of timber will be found under the heading gravity, specific.

WEIGHT OF A CUBIC FOOT IN OUNCES.

Distilled water..... <i>ozs.</i>	1000	Lignum vitæ..... <i>ozs.</i>	1333
Sea-water	1028	Mahogany (Honduras) ...	560
Ash	760	Mahogany (Spanish).....	852
Beech	696	Oak (Dantzic)	760
Cedar	596	Oak (American).....	872
Cork	246	Oak (English)	970
Elder	695	Pitch pine	560
Elm	556	Teak	745
Fir (Forest)	694	Walnut	671
Fir (Riga)	750	Willow	585
Larch	544		

From GRIER'S Mechanics' Calculator and ROBERTS' Mechanics' Assistant.

WEIGHT OF A CUBIC FOOT IN POUNDS.

The timber in every case supposed to be dry, and pure water being=1.

Description.	Cub. ft.	Spec. grav.	Description.	Cub. ft.	Spec. grav.
Ash	47	0·753	Fir, larch ...	31 to 35	0·5 to 0·56
Bamboo	25	0·4	Lancewood...	42 to 63	0·675 to 1·01
Beech	43	0·69	Lignum vitæ	41 to 83	0·65 to 1·33
Birch	44·4	0·711	MahogHonds.	35	0·56
Blue Gum ...	52·5	0·843	— Spanish	53	0·85
Box	60·0	0·96	Maple	49	0·79
Chestnut	33·4	0·535	Oak, European	43 to 62	0·69 to 0·99
Elm	34	0·544	American red	54	0·87
Fir, red pine	30 to 44	0·48 to ·7	Sycamore ...	37	0·59
— spruce ...	30 to 44	0·48 to ·7	Teak, Indian	41 to 55	0·66 to 0·88
— Am. yel. } low pine }	29	0·46	— African...	61	0·98

NEW YORK TABLE OF WEIGHT OF TIMBER.

Per cubic foot.	Green.	Seasoned.	Per cubic foot.	Green.	Seasoned.
	lbs. ozs.	lbs. ozs.		lbs. ozs.	lbs. ozs.
Live Oak	76 10	70 8	Maple	45 0	34 4
White Oak ..	59 14	54 0	Yellow pine .	48 12	35 8
Red Oak ...	63 12	60 10	White pine...	36 12	30 11
Hickory	58 14	52 15	Spruce	43 15	28 14
Locust	60 12	56 4	Elm	56 8	37 5
Cypress	48 3	36 0	Beech	60 0	53 6
Cedar ...	32 0	30 4	White Ash ...	58 3	50 0

The average weight of the different species of timber, used in building and equipping war ships in the U. S. Navy, may be reckoned about 50 lbs. to the cubic foot.

1228. **TIN.** At **Newport**, two or three tiers of boxes of tin plates are laid on good dunnage on the floor, to make a platform; the boxes are then raised from the sides, to meet in the middle, coming as high up towards the deck as possible.

TIN PLATES—THE WEIGHT OF A BOX.

Brand Mark.	No. of Sheets ♣ box.	Size.	Weight ♣ box.	Brand Mark.	No. of Sheets ♣ box.	Size.	Weight ♣ box.
		in. in.	lbs.			in. in.	lbs.
1 Cor 1 Com	225	13 $\frac{1}{2}$ × 10	112	D X	100	16 $\frac{1}{2}$ × 12 $\frac{1}{2}$	126
2 C	"	13 $\frac{1}{2}$ " 9 $\frac{1}{2}$	105	D XX	"	16 $\frac{1}{2}$ " 12 $\frac{1}{2}$	147
3 C	"	12 $\frac{1}{2}$ " 9 $\frac{1}{2}$	98	D XXX ...	"	16 $\frac{1}{2}$ " 12 $\frac{1}{2}$	168
HC ..	"	13 $\frac{1}{2}$ " 10	119	D XXXX .	"	16 $\frac{1}{2}$ " 12 $\frac{1}{2}$	189
HX	"	13 $\frac{1}{2}$ " 10	147	S DC	200	15 " 11	168
1 X	"	13 $\frac{1}{2}$ " 10	140	S DX	"	15 " 11	189
2 X	"	13 $\frac{1}{2}$ " 9 $\frac{1}{2}$	133	S DXX ...	"	15 " 11	210
3 X	"	12 $\frac{1}{2}$ " 9 $\frac{1}{2}$	126	S DXXX .	"	15 " 11	231
1 XX	"	13 $\frac{1}{2}$ " 10	161	S DXXXX	"	15 " 11	252
1 XXX ...	"	13 $\frac{1}{2}$ " 10	182	Wasters ...	225	13 $\frac{1}{2}$ " 10	126
1 XXX ...	"	13 $\frac{1}{2}$ " 10	203	T T	450	13 $\frac{1}{2}$ " 10	112
D C	100	16 $\frac{1}{2}$ " 12 $\frac{1}{2}$	105	X TT	450	13 $\frac{1}{2}$ " 10	126

Small bars of tin are packed in barrels; in blocks, loose. In the island of Banca it is cast in ingots from 20 to 60 lbs. In China the superior sort is called Banca, the inferior Straits tin. At Singapore tin is shipped loose in slabs, and a careful tally should be taken as it is received on board; see copper.

Weights. About 40 ingots of tin go to a ton; a barrel of tin for export contains from 2 to 4 cwt., or the sixth of a ton. A *Swedish* waag 123'2668 lbs.; *Turkish* quintal or cántaro=44 okes; *Malacca* tampang 1 $\frac{1}{2}$ lbs., bedoor 2 $\frac{1}{2}$ lbs.; kiss 15 bedoors or 30 tapangs=40 lbs. 11 ounces; *Surat* maund 37'33 lbs.

1229. TOBACCO flowers in America, in July and August. Paraguay tobacco shipped at Buenos Ayres, is usually in bales measuring about 10 cubic feet; Bahia 80 to 250 lbs.; the shipments from Samarang and Sourabaya are also in bales; Japanese weigh 250 lbs. The ballast for tobacco is less than for cotton, which requires say 27 tons to every 100 tons, according to the build of the ship; dunnage 9 inches, sides $2\frac{1}{2}$. Green or damp tobacco generates heat, and spontaneous combustion may follow; it should never be stowed next the engine room in a steamer, or near oilcake, which see; for injury by odour from hides, see hides; for stowage, see also casks and general cargo. For exportation from England to the Cape of Good Hope and India, manufactured tobacco should be placed in the coolest part of the ship. Proximity to the engine-room of a steamer will destroy its quality more effectively perhaps than damp. In coasting and other vessels it should be stowed in a cold dry place; if it continues long in a warm position, it becomes heated and mildewed and is liable to spontaneous combustion. A separate and distinct manifest is required for tobacco; draft is allowed by the Customs on this article alone.

1230. Capt. POPE, of the brigantine *Jessie*, of Liverpool, loaded at Bahia in November, 1861, a full cargo, 376 tons of tobacco, which consisted of 1,796 bales, weighing from 6 to 13 arrobas each—the arroba of tobacco being 32 lbs. The ballast 47 tons of stone, was trimmed fore and aft, and the dunnage, piassava, weighed from 10 to 12 tons; about 600 bundles of it were spread. So laden, the *Jessie* was in good trim, rather light, and drew 12 feet aft and 11 feet 3 inches forward. With a full cargo of coal, 430 tons, her draught is 13 feet aft and 12 feet 2 inches forward; length over all 125 feet, keel 113 feet, breadth 26 feet and 8 inches, and depth of hold 11 feet 3 inches. In the spring of 1864, the brig *Herald*, 183 tons register, Capt. PHILIP ORSATO, belonging to Messrs. MAIGNY, ROBIN, and Co., of Jersey, took in at Bahia 222 tons (12 cwt. to the ton) of leaf tobacco in bales, when she drew 10 feet 8 inches; with 290 tons of coal 13 feet. In the Court of Exchequer, 3rd July, 1866, CHAVES v. BROOKE. This was an action for injury to tobacco received by bad stowage. Oddly enough, the bill of lading did not contain the usual exception relative to the perils of the sea; plaintiff did not desire to take advantage of this fact. Mr. Baron BRAMWELL said it would be implied that the owners were not responsible for the perils of the sea. For the plaintiff, who is a merchant at Bahia, it was alleged that the tobacco, when shipped, was in a dry and perfect state; but owing to its having been stowed away with piassava—a long thread

grass which grows from trees, and which is cut by the natives, tied up in bundles, and exported to England—it became heated and useless. The grass, it was said, had been exposed to tropical rains, and had been shipped in a wet state. This was answered by a statement that the grass was always exposed to the sun in order to ensure its being dry before it was put under hatches. The defence was that the damage of which plaintiff complained had been brought about by the perils of the sea. The vessel had encountered hard gales and heavy seas, which she continually shipped and became much strained, and when she entered the dock she presented the appearance of having been exposed to severe weather. The tobacco when shipped was both green and wet. The report made by the dock authority, after examination, was that it had been injured by the sea; the moment the hatches were removed, there were direct indications to be seen of water having found its way into the hold. His lordship, with the greatest conciseness, put the case to the jury, who after a very short deliberation found for the defendant.

1231. **Average.** In all species of goods, with one exception, the loss, whatever it may be, is paid by the underwriters, if it amounts to the required limit of danger. The warranty is destroyed and the underwriters become liable. The excepted case is tobacco in casks from America. On this interest the policies, I believe, invariably contain the following clause: "In case of particular average, to pay the excess of 5 ¢ cent. on the value of 10 hogsheads." This arose from the special circumstances under which tobacco is shipped in Virginia and elsewhere. The casks, which are large, are rolled down often from a considerable distance to the shipping place, over roads which are frequently wet and bad; so that a certain degree of damage to the outside part of the contents of the casks is expected, whether the tobacco meet with sea perils or not. It is calculated to be on the average 5 ¢ cent. Any sea damage supervening on this is to be paid. When the casks are in the warehouse the contents are taken out, and the outside of the mass is cut off with hatchets and burnt.—*Hopkins on Average.*

1232. The ship *Cissy*, 649 tons register, Capt. THOMAS SPENCER, belonging to Messrs. TEMPERLEY, CARTER, and DARKE, of Leadenhall Street, left **Yokohama** 18th February, 1864, with 2,147 bales cotton, 80 bales tobacco, 12 bales silk, and 18 cases Japanese curiosities. The bales of cotton weighed on average 270 lbs., and measured 3 feet 10 inches by 2 feet 5 inches by 2 feet 5 inches; tobacco, 250 lbs., 3 feet 10 inches by 2 feet 5 inches by 2 feet 5 inches; and the bales of silk 2 feet 9 inches by 21 inches by 21 inches. The ballast con-

sisted of 230 tons of shingle (\$2 $\frac{1}{2}$ ton). The tobacco formed the ground tier under the main hatchway ; cotton fore and aft and over the tobacco ; silk, curiosities, and cotton in the cabin. So laden she drew aft 14 feet 8 inches, forward 14 feet 8 inches ; on arriving in London, 6th July, 1864, aft 14 $\frac{1}{2}$ feet, forward 14 feet 3 inches ; her best trim aft 15 feet 3 inches, forward 15 feet ; and with a dead-weight cargo, aft 17 feet 4 inches, forward 17 feet. Her **port charges** inward were £3 16s. 3d., outwards £1 15s. ; **pilotage** in \$3 $\frac{1}{2}$ foot, out \$2 $\frac{1}{2}$ foot ; fresh-water brought off in barges \$1 $\frac{1}{2}$ ton.

1233. **Spontaneous Combustion.** Two cases of fire in cargoes of tobacco occurred in the Channel in the spring of 1863. The barque *Trim*, of Bristol, 214 tons register, Capt. JOACHIM BAUMANN, which left Bahia 1st January, with 260 tons tobacco, Brazilian measurement, arrived safely in the Channel. When at anchor off Osborne, 25th March, one of the men complained of steam and smeech in the forecabin. The seals having been broken, the hatches were lifted, but nothing extraordinary could be observed. At three the next morning fire was seen coming out of the main hold, and assistance being obtained, it was kept under by cutting up some of the deck planks, waterways, &c., to admit the hose from the engines, and the *Trim* was towed to Cowes, where two-thirds of her cargo was saved. The brigantine *Trial*, of Halifax, N.S., which left Bahia 18th January for Bremen, took fire in the Channel, and was abandoned off the Isle of Wight 12th April ; her crew landed at Brighton. In both cases the fire is supposed to have arisen from spontaneous combustion, generated probably by shipping the tobacco in too green a state. It was leaf tobacco, in bales 80 to 250 lbs. each, wrapped in gunny, which was dry on shipment. Some of the *Trim's* cargo was screwed, which is said, is contrary to the rule at Bahia. At sea, in dry weather, her hatches were frequently opened ; the top bales were damp from the exhalations of the entire cargo, and steam always escaped. Both cargoes were alike, and were stowed by the same stevedore.

Tonnage. 17 hogsheads, weighing 10 tons, admeasure 850 cubic feet or one keel. The Admiralty allows one hogshead tobacco to a ton. Bengal, Madras, and Bombay ton 50 cubic feet tobacco or cigars, in bales ; at Manilla 50 cubic feet in boxes and bales of tobacco, cigars, &c. ; at New York one hogshead ; at Baltimore 1,500 lbs. Virginia in hogsheads ; 1,300 lbs. Kentucky do. ; 1,000 lbs. Maryland ; a hogshead Virginia is estimated at a standard of 45 feet ; Kentucky, Georgia, and Carolina, 40 feet ; and Maryland and Ohio 35 feet. At Bahia, 12 cwt. leaf in bales, 16 cwt. in serons, 20 cwt. in rolls, 21 cwt. in mangotes, and 40 cubic feet of cigars, go to a ton.

Casks, &c. Hogshead of tobacco 12 to 18 cwt. Cross hogshead 1,000 to

1,300 lbs. An Admiralty hogshead contains 242 lbs. net, barrel 160, half-hogshead 126, and kilderkin 83 lbs. Havannah bale 100 lbs., Lisbon last 4,000 lb.

Hamburg Tarea. Virginia and Kentucky, Maryland and Ohio, Scrubs, Stems, American, 10; and Porto Rico, leaf, 2 $\frac{1}{2}$ cent.; St. Domingo, leaf, 8 lbs. $\frac{1}{2}$ can; Havannah, real; Brazil, rolls, 8 lbs. $\frac{1}{2}$ roll; ditto, leaf, 5 $\frac{1}{2}$ cent.

1234. **TOMMING UP OR OFF** is another name for shoring. When stowing, it frequently occurs that a cask, case, or other package will, as far as its own bulk is concerned, stow, where the want of sufficient entrance or of room to work, prevents its being stowed in the usual manner; it is more difficult if the package is heavy. Suppose there is space for three or more heights of casks, but an intervening beam prevents the riding tier from being stowed in the ordinary way, and compels the stevedores to stow that tier first. It is then lifted and propped up by "toms" or "shores" sufficiently high to allow the lower casks to be entered or set into their berth, when (if necessary) the toms are removed, and all the tiers properly stowed. This operation requires care, especially where the package is cumbrous or of great weight; sometimes the toms capsize, and when screwing certain elastic substances the danger is greatly increased.

1235. **TON.** This word is derived from a ton or weight of water, equal to 2,000 lbs.; it appears that a cubic foot of distilled water weighing 62 $\frac{1}{2}$ lbs. was assumed as a general standard for liquids. This cubic foot, multiplied by 32, gives 2,000, the original weight of a ton. Hence eight cubic feet of water make a hogshead, and four hogsheads a ton in capacity and denomination, as well as weight. A ton = 20 cwt. = 2,240 lbs.

1236. With regard to the Freight of Goods, the term ton is an arbitrary one. The first approach to a system of tonnage for freight appears to have been made on the East Coast of England, where a vessel called a keel was in constant use for loading ships with coal—the most important branch of trade there. A keel contains 21 tons 4 cwt., or 1,008 cubic feet compressed in a ship's hold to 850 cubic feet, or 40 cubic feet $\frac{1}{2}$ ton of 20 cwt.; this is the standard by which more or less all goods are freighted. 20 cwt. wheat, some sugars in bags, &c., go to a ton, and measure about 40 cubic feet.

1237. If all other goods weighed the same as coal, wheat, &c., (where the weight and measurement are so nearly equal) little difficulty would occur in regulating the freight. Being otherwise, the merchant and shipowner make a mutual arrangement, governed to a certain extent by the above data, for the conveyance of goods, which are in some cases estimated by weight; in others by measurement, and in others by quantity and number; but the term ton is retained

in almost every case. The difficulty which a master has to contend with in taking cargo, irrespective of the sharpness or flatness of his ship's bottom, is to know exactly how much of different sorts she will carry or stow. This applies especially to compressible articles like hay, hemp, cotton, hides, &c., and to cargoes in casks.

1238. Heavy goods are generally freighted by weight ; sometimes more than 20 cwt. are allowed to a ton for freight. Light goods are freighted by measurement, and it often occurs that more than 40 feet are allowed to a ton for freight, and that even then the weight is much less than 20 cwt. The following table will make the subject more clear.

		Description.		A freight ton.	
BY WEIGHT {			cub. ft.	cwt.	
BY WEIGHT {		Solid Iron	48	—	
		Coal	40	20	
		East India Sugar, in bags ..	—	20	
		African Oak	40	23	
		Cinnamon, in bales	—	6	
MEASURE- MENT. {		East India Sugar, in chests.....	50	—	
		Cinnamon, in chests.....	50	—	
		Hides, East India.....	45	14	
		If not well screwed, do.	60	14	
QUANTITY. {		8 Barrels Flour, of 196 lbs. each ...	—	14	
		36 Bushels American wheat, in bulk...	—	19	
		1,000 Rattans	—	16	

1239. Besides these seeming discrepancies, the rates vary in different ports, as may be seen by comparing them in the various tables at the commencement of this work, where there is also a very useful table for finding the number of tons of coal a vessel will carry ; a table for calculating the space required for goods which can be measured by the bushel, is appended to the article seeds. Foreign tons are referred to in the article tonnage, which follows.

1240. BRIDGNELL'S *Indian Commerce* says : a vessel floating on water is capable of carrying only a certain quantity of goods, the utmost extent of which is such, that if any extra quantity be added, she will no longer be considered safe. The maximum which a vessel can safely carry is generally known, and when loaded she has a draught of water varying from 2 to 20 feet, more or less, according to her size and build. The space also, that is allotted to store goods

in the hold, can be ascertained and is generally known, it being always desirable that a vessel should be so loaded as to carry her maximum of cargo, and that it should be so disposed as fully to occupy the entire available space in her hold. This is the primary object: for when thus loaded there is a great probability of realising the best freight. Thus, for example, it is desirable that a vessel capable of carrying 700 tons, should be loaded with 700 tons of goods, and if her hold has a space of 42,000 cubic feet, the goods engaged should be so apportioned as to occupy the entire space. In the above case for every ton of goods there is a space of 60 feet (*188'), and if any description of goods, every ton of which occupies 60 feet, was engaged for it, the vessel with this kind of cargo should be loaded in the manner that is most desirable. But goods are of variable densities, in illustration of which it may be mentioned that whilst a ton of saltpetre occupies only 35 feet, a ton of ginger occupies 80, and it is owing to this variation in the densities, that it becomes difficult to assign the due proportion of each of the many kinds of export cargo that would serve in the aggregate to fill a vessel in the way referred to. If a vessel, say of the above tonnage and capacity, were required to be loaded with one kind of dead-weight and one kind of light freight, and if 35 and 80 feet were the cubic representatives of a ton of each, it would be apparent that 700 tons of the dead-weight would occupy only 24,500 feet, and leave 17,500 feet unoccupied, while on the other hand 700 tons of light freight would occupy 56,000 feet, or 14,000 feet more than her space. Consequently only a due proportion of each can occupy the entire space and jointly weigh 700 tons. It is from the want of acquaintance with the method of ascertaining this due proportion that many vessels leaving port are obliged to re-land a quantity of goods which is in excess either of her tonnage or the space in her hold. By adopting, however, the following formula when chartering, the trouble and loss occasioned by re-lands will be entirely removed, a full cargo obtained, and the most advantageous freight realised.

Find the average space per ton in a vessel, by dividing the space in her hold by the tonnage she can carry.

From this average deduct the space per ton of dead-weight, multiply the remainder by the tonnage, and divide the product by the difference between the space per ton of light freight and that of dead-weight.

The quotient is the amount of light freight required, and the difference between it and the tonnage, the amount of dead-weight goods.

Let the formula be applied to the foregoing case.

Tons.....	700)	42,000 feet	(60 average space per ton
		42,000	35 dead-weight space per ton
<hr/>			
Light freight space per ton	80	25 difference ; multiply by	
Dead-weight ditto	35	700 tonnage	
<hr/>			
Difference 45)	17500	(389 tons nearly for light freight	
	135	311 tons for dead-weight	
<hr/>			
Check.			
389 × 80 =	31,120	400	—
311 × 35 =	10,885	360	700
<hr/>			
	400		
	405		
<hr/>			
Total 42,005 feet, shewing a difference of only 5 feet in excess, owing to the omission of fractions.			

[It has been suggested as much easier to work out the formula thus, ONE—Multiply the space per ton occupied by the light freight by the tonnage of the vessel, and subtract the product from the space in her hold. Two—Divide the remainder by the difference of space occupied by a ton of each kind of cargo ; this gives the number of tons of light freight ; which subtracted from the tonnage of the vessel gives the number of tons for dead-weight. Thus using the same example :

	cub. ft.	
Light freight space per ton =	80	35
Dead-weight..... =	35	700
<hr/>		
	subtract 24500	
	from 42000	
<hr/>		
Difference.....45	) 17500	(389 tons nearly for light freight
	135	700
<hr/>		
	400	311 tons nearly for dead-weight
	360	
<hr/>		
	400	
	405	

By this mode the long division sum was avoided, viz., the one for finding the average space per ton in the vessel. In practice a fractional number will occur more frequently than otherwise, and this will involve a complication in the former mode which will be obviated in the latter.]

In ordinary commercial transactions, it never happens that any two kinds of goods are engaged as freight for a vessel, although the Calcutta market affords such a variety, they are distinguished as has been above noticed, into dead-weight and light-freight goods. If, therefore, when a vessel requires freight, an average be made of the densities of dead-weight and light-freight goods, exportable at the time, and by the foregoing formula, the amount of each be ascertained, the anticipated and desired object for shipowners will be realized. For this purpose the following list is appended, showing the average densities of dead and light weight exports at Calcutta.

LIST OF THE TONNAGE SPACE OF CALCUTTA CARGOES.

Saltpetre.....	Occupies 35 cub. ft. per ton of 20 cwt.		
Sugar	—	39	— 20
Rice, Tincal, Borax	—	42	— 20
Wheat.....	—	44	— 20
Flour	—	48	— 20
Turmeric	—	65	— 20
Ginger	—	80	— 20
Jute, Hemp	{	— or 53	— 1500 lbs.
		35½	— 20 cwt.
Indigo, Shell Lac, {	— or	50	— 20 Ind. mea.
Lac Dye		36½	— 20 cwt.

1241. **TONNAGE (ADMEASUREMENT).** Admeasurement Tonnage or Register Tonnage, is the internal measurement of a ship as decided by the Custom-house authorities under the Merchant Shipping Act, 1854. The first regular system of admeasurement was introduced in 1773, when the tonnage was calculated by length and breadth only, and there being no limitation as to depth, the ships were neither models for shape nor patterns for sailing—the aim of the owners being naturally to carry a large quantity of goods in a vessel of small register tonnage, that register being the gauge by which various imposts are levied and many restrictions are governed. As the long, narrow and slow ships thus brought into existence were being rapidly supplanted by the swifter ships of America, an alteration in the Customs' admeasurement was adopted in 1835, but the principle of 1773 was too much retained. In 1854 considerable improvement was obtained through an Act of Parliament, which continues in operation, the details of which are given below. When distinguishing ships registered under the old act, it is customary to attach the letters *o.m.* to the tonnage; the letters *n.m.* are attached to the second system, 1835; and *n.n.m.* to the present system. *N.n.m.* is about 9 to 10 $\frac{1}{2}$ cent. less than *n.m.* For instance, a ship measuring

200 tons *n.m.* will measure 180 tons *n.m.* or thereabout. In re-admeasuring the old wall-sided deep vessels, the new registered tonnage is greater than under the Act of 1835. On the contrary, the long and sharp ship registers less. The Merchant Shipping Act, 1854 says: "This so-called register tonnage is for fiscal purposes only. It does not represent the number of tons weight the vessel will carry; for while the yacht, built for speed, will not carry her so-called register tonnage, the sailing barge that makes short voyages across the Channel, will carry 80 $\frac{1}{2}$ cent. above her register tonnage, or say that one will carry twice as much as the other, both being registered as of the same tonnage. The modern sailing merchant ship usually carries from 30 to 50 $\frac{1}{2}$ cent. over her register tonnage. The modern steamer, however, with spar and awning decks or deck-houses, would not carry her so-called register tonnage.

1242. Parliamentary mode of Measurement. In these rules the Tonnage Deck is the Upper Deck in ships having less than three decks, and the Second Deck from below in all others; all measurements are taken in feet and fractions, and all fractions are in decimals.

1243. RULE 1.—The tonnage of every ship to be registered, with the exceptions mentioned in the next section, must, previously to her being registered, be ascertained by the following rule, afterwards called Rule 1; and the Tonnage of every ship to which such rule can be applied, whether she is about to be registered or not, must be ascertained by the same rule.

1. Measure the length in a straight line along the upper side of the Tonnage Deck, from the inside of the inner plank (average thickness) at the side of the stem, to the inside of the midship-stern timber or plank there, as the case may be (average thickness) deducting from this length what is due to the rake of the bow, in the thickness of the deck, and what is due to the rake of the stern timber, in the thickness of the deck, and also what is due to the rake of the stern timber, in one-third of the round of the beam;* divide this length into the number of equal parts required by the following table, according to the class in such table to which the ship belongs.

TABLE: Class 1.—Ships, of which the Tonnage Deck is, according to the above measurement, 50 feet long or under, into 4 equal parts. Class 2.—Ships 50 feet long and not exceeding 120, into 6 equal parts. Class 3.—Above 120 and not exceeding 180, 8 equal parts. Class 4.—Above 180 and not exceeding 225, 10 equal parts. Class 5.—Ships, of which the Tonnage deck is, according to the above measurement, above 225 feet long, into 12 equal parts.

2.—Then, the hold being first sufficiently cleared, find the transverse area of such ship, at each point of the length, as follows:—Measure the depth at each point of division, from a point at a distance of one-third of the round* of the

* Round of beam relates to depth, not length.

beam below such deck,—or, in the case of a break, below a line stretched in continuation thereof, to the upper side of the floor timber at the inside of the limber strake, after deducting the average thickness of the ceiling which is between the bilge planks and the limber strake; then, if the depth at the midship division of the length do not exceed sixteen feet; divide each depth into four equal parts; then measure the inside horizontal breadth at each of the three points of division, and also at the upper and lower points of the depths extending each measurement to the average thickness of that part of the ceiling which is between the points of measurement; number these breadths from above (*i.e.* numbering the upper breadth one, and so on down to the lowest breadth); multiply the second and fourth by four, and the third by two; add these products together, and to the sum, add the first breadth and the fifth; multiply the quantity thus obtained by one-third of the common interval between the breadths, and the product is deemed the transverse area; but if the midship depth exceed sixteen feet, divide each depth into six equal parts instead of four, and measure as before directed, the horizontal breadth at the five points of division, and also at the upper and lower points of the depth; number them from above as before; multiply the second, fourth, and sixth, by four, and the third and fifth by two; add these products together, and to the sum, add to the first breadth and the seventh; multiply the quantity thus obtained, by one-third of the common interval between the breadths, and the product is deemed the *transverse area*.

3.—Having thus ascertained the transverse area at each point of division of the length of the ship, as required by the above table, proceed to ascertain the register tonnage as follows:—number the areas successively, 1, 2, 3, &c., No. 1 being at the extreme limit of the length at the bow, and the last number at the extreme limit of the length at the stern; then, whether the length be divided according to the table into four or twelve parts, as in Classes 1 and 5, or any intermediate number, as in Classes 2, 3, and 4, multiply the second and every even-numbered area by four, and the third and every odd-numbered area (except the first and last) by two; add these products together, and to the sum, add the first and last, if they yield anything: multiply the quantity thus obtained by one-third of the common interval between the areas, and the product will be the cubical contents of the space under the tonnage deck; divide this product by 100, and the quotient being the tonnage under the tonnage deck, is deemed to be the register tonnage, subject to the additions and deductions hereinafter mentioned.

If there be a *break*, a *poop*, or any other permanent closed-in space on the upper deck, available for cargo or stores, or for the berthing or accommodation of passengers or crew, the tonnage of such space is thus ascertained. Measure the internal mean length in feet, and divide it into two equal parts; measure at the middle of its height, three inside breadths, namely, one at each end and the other at the middle of the length; then, to the sum of the end breadths, add four times the middle breadth, and multiply the whole sum, by one-third of the common interval between the breadths; the product gives the mean horizontal area of such space; then, measure the mean height, and multiply by it the mean horizontal area, divide the product by 100; and the quotient is deemed to be the tonnage of such space, and is to be added to the tonnage under the tonnage deck, ascertained as aforesaid, subject to the following provisos:—1stly, that nothing is to be added for a closed-in space solely appropriated to the berthing of the crew, unless such space exceeds 1-20th of the remaining tonnage of the ship, and in case of such excess, the excess only shall be added; and, 2ndly, that nothing

is to be added in respect of any building erected for the shelter of deck passengers, and approved by the Board of Trade.

5.—If the ship has a third deck, commonly called a spar deck, the tonnage between it and the tonnage deck is ascertained as follows:—Measure in feet the inside length of the space at the middle of its height, from the plank at the side of the stem to the lining on the timbers at the stern, and divide the length into the same number of equal parts into which the length of the tonnage deck is divided as above directed; measure (also at the middle of its height) the inside breadth of the space at each of the points of division, also the breadth of the stem and at the stern: number them successively 1, 2, 3, &c., commencing at the stem; multiply the second and all other even-numbered breadths by four, and the third and all the other odd-numbered breadths (except the first and last) by two; to the sum of these products, add the first and last breadths; multiply the whole sum by one-third of the common interval between the breadths, and the result will give in superficial feet, the mean horizontal area of such space, measure the mean height of such space, and multiply it by the mean horizontal area, and the product will be the cubical contents of the space; divide this product by 100; and the quotient is deemed to be tonnage of such space, and is to be added to the other tonnage ascertained as aforesaid; and if the ship has more than three decks, the tonnage of each space between the decks above the tonnage deck must be severally ascertained in manner above described, and is to be added to the tonnage of the ship ascertained as aforesaid.

1244. RULE 2—Ships which, requiring to be measured for any purpose other than registry, have *cargo on board*, and ships which requiring to be measured for the purpose of registry, cannot be measured by the rule above given, must be measured by the following rule, called Rule 2:—

1.—Measure the length on the upper deck from the outside of the outer plank at the stem to the aftside of the stern post, deducting the distance between the aftside of the stern post and the rabbet, at the point where the counter plank crosses it; measure also the greatest breadth of the ship to the outside of the outer planking or wales, and then—having first marked on the outside on both sides thereof, the height of the upper deck at the ship's side—girth her at the greatest breadth, in a direction perpendicular to the keel, from the height so marked on the outside on the one side, to the height so marked on the other side by passing a chain under the keel; to half the girth thus taken, add half the main breadth; square the sum: multiply the result by the length taken as aforesaid; then multiply this product by the factor '0017 (seventeenth ten-thousandths) for wooden ships, and by '0021 (twenty-one ten-thousandths) for those of iron, and the product is deemed the register tonnage, subject to the additions and deductions hereinafter mentioned. Some consider '0016 nearer for sailing and '0020 for steam ships.

2.—If there be a *break*, a *poop*, or other closed-in space on the upper deck, the tonnage is ascertained by multiplying together—the mean length, breadth, and depth of such space, and dividing the product by 100, and the quotient so obtained is deemed to be the tonnage of such space, and subject to the deduction for a closed-in space appropriated to the crew, as mentioned in Rule 1, is to be added to the tonnage of the ship ascertained as aforesaid.

1245. RULE 3—In every *ship propelled by steam*, or other power requiring engine room, an allowance is made for the space occupied by the propelling power, and the amount so allowed is to be deducted from the gross tonnage ascertained as aforesaid, and the remainder is deemed to be the register tonnage of such ship, such deduction is to be estimated as follows :—

a.—As regards ships propelled by *paddle wheels*, in which the tonnage of the space solely occupied by, and necessary for the proper working of the boilers and machinery, is above 20 and under 30 $\frac{1}{2}$ cent. of the ship's gross tonnage, such deduction is 37-100ths of such gross tonnage; in ships propelled by *screws*, in which the tonnage of such space is above 13 and under 20 $\frac{1}{2}$ cent. of such gross tonnage, such deduction is 32-100ths of such gross tonnage.

b.—As regards all other ships, the deduction, if the Commissioners of Customs and the owner, both agree, it is to be estimated in the same manner; but either they or he may, in their or his discretion, require the space to be measured, and the deduction made accordingly; whenever such measurement is so required, the deduction must consist of the tonnage of the space actually occupied by, or required to be enclosed for, the proper working of the boilers and machinery, with the addition, in the case of paddles, of $\frac{1}{2}$, and of screws, $\frac{2}{3}$ ths of such space; the measurement to be governed by the following rules :—

1.—Measure the depth of the space from its crown to the ceiling at the limber strake,—measure also three, or if necessary, more than three breadths of the space at the middle of its depth, taking one of such measurements at each end and another at the middle of the length; take the mean of such breadths; measure also the mean length of the space between the foremost and aftermost bulkheads or limits of its length, excluding such parts, if any, as are not actually occupied by or required for working the machinery; multiply together these three dimensions of length, breadth, and depth, and the product is the cubical contents of the space below the crown; then find the cubical contents of the space or spaces, if any, above the crown aforesaid, which are framed in for the machinery or for the admission of light and air, by multiplying together the length, depth, and breadth thereof; add such contents to the cubical contents of the space below the crown; divide the sum by 100 : and the result is deemed to be the tonnage of the said space :

2.—If in any ship, in which the space aforesaid is to be measured, the engines and boilers are fitted in separate compartments, the contents of each must be measured severally, according to the above rules, and the sum of their several results is deemed to be the tonnage of the said space :

3.—In the case of screw steamers, in which the space aforesaid is to be measured, the contents of the *shaft trunk* are to be added to and deemed to form part of such space, and must be ascertained by multiplying together its mean length, breadth, and depth, and dividing the product by 100 :

4.—If in any ship, in which the space aforesaid is to be measured, any alteration be made in the length or capacity of such space, or if cabins are fitted such ship is deemed to be a ship not registered, until re-measurement.

5.—If in any ship, in which the space aforesaid is to be measured, any goods or stores are stowed or carried in such space, the master and owner are each liable to a penalty not exceeding £100.

1246. **RULE 4.**—In ascertaining the Tonnage of Open Ships, the upper edge of the upper strake is to form the boundary line of measurement, and the depths are to be taken from an athwart ship line, extended from upper edge to upper edge of the said strake, at each division of the length.

1247. **Builder's Measurement.** In disposing of their ships, builders generally adhere to the law of 1773, which enacts that

The *length* shall be taken in a straight line along the rabbet of the keel, from the back of the main stern-post to a perpendicular line from the fore-parts of the main-stem under the bowsprit. The *breadth* also shall be taken from the outside of the outside plank, in the broadest part either above or below the main wales, exclusive of all manner of doubling planks that may be wrought upon the sides. Three-fourths of the breadth to be deducted from the length. Multiply the remainder by the breadth and that product by the half-breadth, then divide by 94.

If the ship be afloat, the directions are, "To drop a plumb-line over the stem, and measure the distance between such line and the after-part of the stern-post, at the load water mark; then measure from the top of the said plumb-line, in a parallel direction with the water, to a perpendicular point immediately over the load water mark at the fore-part of the main-stem: subtracting for each admeasurement the above distance, the remainder will be the ship's extreme length, from which is to be deducted three inches for every foot of the load draught of water for the rake abaft; from the length, taken in either of the ways above mentioned, subtract three-fifths of the breadth taken as above, the remainder is esteemed the just length of the keel to find the tonnage; then multiply this length by the breadth, and, dividing by 94, the quotient is deemed the true contents of the lading."

1248. The common rule for finding the burthen of ships by this mode is, to multiply the length by the extreme breadth, and that product by half the extreme breadth, and divide by 94, thus; length \times extreme breadth \times half the extreme breadth \div 94 = builders' tonnage.

1249. Another authority says multiply the length of the keel taken within board, by the breadth of the ship within board, taken from the midship beam, from plank to plank. Multiply the product by the depth of the hold, taken from the plank below the keelson to the under part of the upper deck plank, and divide the last product by 94; then the quotient is the content of tonnage required. A practical builder says: "Subtract three-fifths of the main beam from the length for tonnage, viz.—length of keel and rake of stem. Multiply the product by the beam, and then by half the beam, and divide the remainder by 94, which will give her old tonnage. The beam for old tonnage is taken at the greatest external breadth, either above or below the thick plank of the main wales, but not on the wales."

1250. In builders' measurement it matters not how deep a vessel

is nor how many deck-houses she may have. As a rule the builders' measurement gives a greater tonnage than the register. Four schooners belonging to the South Devon Shipping Company by builders' tonnage measured 877 tons, by register 589 tons *n.r.m.*; these vessels carry in the summer, dead-weight cargo 934 tons, and possess good sailing qualities. As a general rule a ship of 100 tons register will carry a cargo weighing 150 tons; some ships registering say 500 tons may carry a general cargo of 1,000 tons. It is held that if an owner wants a good vessel, he can stipulate for payment by registered tonnage, coupled with classification in LLOYD'S Register; and that this will be a surer test than buying by length and breadth only, irrespective of depth or form. If an owner paid for registered tonnage, he would get 109 cubic feet for every registered ton. Owners consider that, if a vessel will not carry more than her register, she is unprofitable; and it is known that a ship can be built with lines so fine that it would be imprudent to load her to her registered tonnage. This, however, applies mostly to vessels built for fast steaming or sailing, irrespective of dead-weight capacity. For sailing vessels it is easy to lay down a standard, but the requirements of steamers render a general rule difficult. It is time however, to abandon the obsolete law of 1773 in the *building* and *purchase* of ships, for it cramps the energy of designers, and has produced a discreditable class of ships. To keep pace in the present race, owners should discard the purchase by builders' measurement, and adopt the law of 1854; the builders will then be in a position to still further improve the style of naval architecture. Some ships built in the United States and British provinces, take more weight in cargo in proportion to tonnage, through the lightness of material used in the construction.*

FOREIGN TONNAGE.—Austria. Of steam-ships (340) the English ton is equal to the Austrian (30 ϕ cent. being allowed for the engine and coal-room), but of sailing ships, the Austrian tonnage exceeds the English register ton; about 47 soldi (11 $\frac{1}{2}$ ϕ d.) are paid from foreign ports, and about 37 (8 $\frac{1}{2}$) from Austrian ports.

Brazilian tons are often calculated to exceed the British register tonnage by one-third.

* Formerly the 64 shares into which a vessel was divided, were considered equal to 1 lb. avoirdupois; the owner of four shares being called the owner of an ounce, of two shares half an ounce and so on. This resembles the crucial division among the Romans. See Cicero Pro Cœcilia VI., sec. 17.

China. Rules for calculating the tonnage dues payable upon Continental vessels :—

- 1.—If the vessel be provided with a British certificate of measurement, dues are to be charged in accordance with the tonnage therein specified.
- 2.—*Bremen and Hamburg* : four lasts are equal to nine register tons.
- 3.—*Holland* : four lasts are equal to seven register tons.
- 4.—*Denmark* : four lasts are equal to about eight register tons.
- 5.—*Prussia, Sweden, Norway, Lubeck, Mecklenburg, Hanover, and Oldenburg* : four lasts are equal to six register tons.
- 6.—*Austria* : four lasts are equal to three register tons.

The powers which have treaties with China are Great Britain, France, the United States, Russia, Prussia, and Denmark.

Denmark. A Commercial Last is equal to 80 cubic feet Danish.

100 feet Danish=97 feet English, or 5,200 lbs. Danish.

90 $\frac{1}{4}$ lbs. Danish=100 lbs. English.

As an approximated reduction usually applied to brigs and larger vessels, 1 Danish commercial last is equal to 2.10 tons English. For smaller vessels 1.99. A notice, dated Board of Trade, 11th April, 1868, authorizes the ships of Denmark, the certificates of which are dated on and after 1st October, 1867, to be of the tonnage denoted on their certificates.

France fixes the tonnage by three dimensions, the total of which is divided by a certain figure. There is very little difference between the tonnage of the two nations. An experienced firm in London says, 9th August, 1866, "It is seldom we are enabled to get French ships measured here under rule 1, as they have almost always some portion of their cargo remaining on board, or are unable to stand without ballast, when it becomes necessary to have them measured externally. As a rule we expect a French ship to measure rather more here than in France, for there they make an allowance for the poop and all houses above deck, whereas our officers do not. For your information we annex the measurement of several French ships which we have had to our address."

English Meas.	French Meas.	English Meas.	French Meas.
429 tons =	412 tons.	56 tons =	61 tons.
129 =	133	117 =	114
459 =	423	483 =	486
434 =	456	104 =	78
292 =	310	191 =	180

The above gives a total of 2,694 English tons register to 2,654 French ; this result is used in the following general table, page 733.

Genoa. Vessels with their draught of water painted on the bows or stern pay for the highest mark, and not for what they may actually draw. There are steam-tugs, but they have no fixed tariff. The anchorage dues on sailing vessels and steamers are 50 cents \wp ton. Vessels loading outwards marble or other goods, require stevedores, who are appointed by the merchant at the ship's expense, and marble costs 4 francs \wp $1\frac{1}{2}$ tons stowage; other goods 1 franc \wp ton measurement.

Germany.—Lubeck. A Last for sea-going and sharply-built vessels is 4,000 lbs.; flat-bottomed open vessels 5,000 lbs. Vessels plying between Lubeck and Schonberg 6,000 lbs.

Greece. One ton of a Greek merchant vessel is equal in weight to 2,000 French kilogrammes, which are reckoned to occupy 42 cubic feet, so that a vessel of 8,400 cubic feet would be of 200 tons. Some say 100 tons English = 0.76 Greek.

Hanover. An English ton register may be assumed to be half a Hanoverian last. Many statements have been regulated by the Bremen last, 4,000 lbs. = 4,400 lbs. English, or about two tons English = 4,480 lbs.

Holland. ARTICLE 3. Every ton of a sea ship is considered to equal 1,000 Netherland lbs. or $1\frac{1}{2}$ cubic ells.

MEASUREMENT OF THE TONNAGE OF SHIPS.

$1\frac{1}{2}$ Kubicke Ellen = 1 Scheepston = 52.9755 cubic feet.

2 Scheepstonen = 1 Scheepolast = 105.951 „

Italy. In steam-ships the English ton has an advantage of about 10 \wp cent., 40 \wp cent. instead of 30 \wp cent. being allowed for the engine and coal room; the charges are, therefore, about 49 cents, equal to 4 $\text{li}.d.$ per ton. Steamers may also pay the charges for one year on payment of 150 lire for light dues, and 50 cents for health dues. In sailing vessels the English ton is equal to the Italian, and pays for health dues 20 cents, and light dues 50 cents—together 70 cents, or about 6 $\text{li}.d.$

Mexico. The tonnage is similar to the Spanish. Vessels arriving in Mexican ports pay harbour dues at per ton as per Burgos measurement.

The following table must, for several countries, be accepted only as an approximation of the relative tonnage. In some foreign states deductions are made for deck-houses, in others none. In some few places the tonnage rates are regulated by the number of the masts of the ship. Under the heading Lastage there may be some information applicable to the tonnage of vessels.

TABLE SHOWING TONNAGE—FOREIGN COMPARED WITH ENGLISH, &c.

AUSTRIA .....	.....	110'16 ton Austrian	100 tons English
BELGIUM .....	.....	44½ do. Belgian } 42 cub. ft.	502 ditto
.....	.....	73 do. ditto } to the tn.	66 ditto
BRAZILS	Rio de Janeiro	7 Brazilian ton	5 tons English
COLOMBIA	Venezuela ...	140 Venezuelan ton	100 ditto
.....	.....	112 to 112½ tons	100 U. States
.....	.....	134½ tons	100 French
.....	NewGranada	1½ cubic metre in space } 1000 kilogrammes weight }	1 English ton of 2,240 lbs.
DENMARK	Copenhagen.	44½ Danish lasts	100 do. Brit. ship
.....	.....	59 lasts	102 tons
.....	.....	68 lasts	145 tons
.....	.....	75 lasts	144 tons
FRANCE .....	.....	265 tons French averages	269 tons English
GERMANY	Griefswald ...	123 lasts	175 British ship
.....	Lubeck	69½ lasts	162 register
.....	Bremerhaven	300 lasts	450 ditto
GREECE .....	.....	76 Greek tons	100 ditto
HANOVER .....	.....	Hanover last, 6,000 lbs. ...	6,600 lbs. English 3 ton Eng. 6,720lb
HOLLAND	Amsterdam .	158 lasts, or	300 British ship
.....	.....	316 Dutch ton	70 tons
.....	.....	84 lasts	100 tons Eng. o.m.
ITALY .....	.....	110 tons Italian	90 tons do. o.m.
.....	.....	100 ditto	429 tons
MECKLEN'B'RG	Rostock ...	195 lasts	same as Spain
MEXICO .....	.....	As per Burgos measurement	100 tons Eng. n.m.
NETHER L'NDS	.....	107'3 tons Netherlands ...	100 British ship
NORWAY	Christiana ...	49 Norwegian lasts	223 tons
OLDENBURG ...	Duchy of ...	100 Common lasts	agway
PARAGUAY ...	Eng. register	Tonnage is accepted in Par-	212 o.m. 207 n.m.
PORTUGAL ...	Oporto	204 Oporto tons	140 British ship
PRUSSIA	Memel	102 lasts, ea. 4,000 lb. Prus.	154 register
.....	Swinemunde.	108 lasts	112 English tons
RUSSIA	Revel ...	48 Swedish lasts	86 British ship
SICILY	Palermo	103 Sicilian tons	386 Brit. about
SPAIN .....	.....	320 Spanish tons	46 ditto
SWEDEN	Carlsand ...	23 Swedish lasts	70 register
.....	Carlscona	46 ditto	277 tons
.....	Drontheim	114½ ditto	48 register
.....	Helsingburg...	33 ditto	100 reg. B. ship
.....	Landscona .	54'42 ditto	
TURKEY .....	.....	Same as English	
UNITED STATES*	.....	320 ton)	340 tons
.....	.....	884 ton) Previous to 1865	930 tons
.....	.....	855 ton)	940 tons

* See the pages following.

Entered at Stationers' Hall.

NETHERLANDS NEW MEASUREMENT.

1 Eng. ton=1.1 Neth. ton.		1 Neth. ton=0.9 Eng. ton.	
2	2.1	2	1.9
3	3.2	3	2.8
4	4.3	4	3.7
5	5.4	5	4.7
6	6.4	6	5.6
7	7.5	7	6.5
8	8.6	8	7.5
9	9.7	9	8.4
10	10.7	10	9.3
20	21.5	20	18.6
30	32.2	30	28.0
40	42.9	40	37.3
50	53.6	50	46.6
60	64.4	60	56.0
70	75.1	70	65.3
80	85.8	80	74.6
90	96.5	90	83.9
100	107.3	100	93.2
200	214.5	200	186.5
300	321.8	300	279.7
400	429.0	400	373.0
500	536.6	500	466.2
600	643.5	600	559.4
700	750.6	700	652.7
800	858.0	800	745.9
900	965.3	900	839.2
1000	1072.5	1000	932.4

This table is computed on an average of 13 English and Dutch registers and gives one English ton=1.0725 Dutch ton. The true proportion, however, is = 1.016. The first named proportion is even preferred, because it may be reckoned that the faults of the measuring rules of both nations have equally shared in this table, and will make it more practical for use. The proportion of new measurement to new-new measurement is about 9 to 10 $\frac{1}{2}$ cent. less; for instance: a ship being measured by new measurement 200 tons, will measure by new-new measurement only 180 tons or thereabout.

Oldenburg. The measure of content, the Commerz Last is 6,000 lbs.; these lbs. are 12 $\frac{1}{2}$ cent. heavier than British; that is 100=112; from this data the equivalent number of tons to a last may be found.

Port-au-Prince. A vessel of 160 tons register in English measures 199½ tons Haytian.

Portugal. The Portuguese measurement corresponds exactly

with the French cubic measurement. The following is a comparative list of Portuguese and English measurements, according to the Custom-houses of each country.

	Portuguese.	English.
SALVADOR	117 tons	111 tons.
S. S. MARIA PIA...	508	392
ALTIVO	163	155
LISBONENSE	422	414½

100 cubic metres (approximately)=88,290 tons register.

Rio Grande do Sul. The Brazilian measurement for tonnage is from 35 to 40 ϕ cent. more than British.

Russian Tonnage. Board of Trade, Whitehall, 10th June, 1858. The Committee of Privy Council for Trade have received a copy of a note from the Russian Minister at this court, relative to an Imperial decree, establishing a new system for the measurement of vessels in Russia, which is given below, and stating that the rule will be applied henceforth to all Russian vessels, without exception; but that with regard to foreign vessels, the method will only be applied in case the masters are unable to produce either a document, establishing their right to float the colours, or ship's papers known in Russia under the denomination of "*Titres de propriété du bâtiment*," which documents should certify the number of lasts measured by the ship to which they belong.

Russian mode of determining the tonnage or lastage:

(1.) Measure in English feet: *a*, the length of the upper deck from the back of the stem to the front of the stern-post: *b*, the breadth inside of the under surface of the planking of same deck, taken amidships; and *c*, the depth in the ship's well over the keel from the deck planks to the limber-boards.

(2.) Multiply the three preceding dimensions in one another, that is to say the length, breadth, and depth, and divide the product by 130, the quotient will give the capacity of the ship in tons; and by dividing this quotient by 2, the capacity in lasts will be obtained.

(3.) If there is a *poop* on the upper deck, or a light deck above the quarter-deck, they must in each case be measured *length* inside, *breadth* amidships, and the height between the planks of the decks. Multiply these three dimensions into one another, divide the product by 90, and then divide the quotient by 2; the quotient after the last division must be added to the measurement previously obtained, and the sum total will give the whole capacity in lasts.

(4.) *Steam vessels* are to be measured like sailing vessels, but three-fourths of a last is to be deducted for each nominal horse-power of the engine.

As a rule a Russian last is considered as equivalent to two tons English.

Sweden and Norway. In June, 1868, the French Customs authorities determined, after measuring 50 vessels, to take the Norwegian last, as 2½ of the French ton, and the Swedish last as 3½. The fixing of the tonnage of vessels gives rise to complicated operations. The Swedish government decreed on 21st December, 1865, that the figures of the measurement of merchant ships should be marked on

her with a red hot iron, and the internal capacity in English tons register calculated at 108 cubic feet each. The Swedish mode in 1829 was as follows:—The length of the ship is taken on the upper deck from the stem to the stern-post, the breadth within the ceiling, and the draught of water from the plank of the said upper deck to the plank of the bottom; these three dimensions are multiplied together, and the product is divided by 200; the five-sixths of the quotient will be the weight which the ship can take in lasts of 18 skippund iron weight per last; as much per cent. however is subtracted from the quantity as the measurer judges the ship more or less full in the floors, or as it carries a greater or less number of guns. The remainder is the burden in lasts.

Spanish. *Rules for ascertaining a vessel's Spanish tonnage:*—Let A be the length from stem to stern-post; B, the breadth measured across the main deck amidships; C, the breadth, but measured from outside, that is including the thickness of the sides of the vessel; D, depth of hold.

Then the Spanish tonnage = $\frac{1}{4} (A + 3 B) (C) (D)$

70·19

Or one quarter of the length added to three times the inside breadth, multiplied by outside breadth and by depth of hold; divided by 70·19. If the depth of the space between decks should be less than six feet, 10 $\frac{1}{2}$ cent. will be added; and if more than six feet, 14 $\frac{1}{2}$ cent. If vessels of large burthen without inside boarding, 8 $\frac{1}{2}$ cent. will be added; if with much dead rise of floor timbers, 5 $\frac{1}{2}$ cent. will be deducted.

United States. The law for the measurement is so changed as to make the tonnage give the actual carrying capacity of every description. The mode of tonning in the United States may vary from the system followed in the United Kingdom, but the same result substantially is reached. A vessel of 100 tons burthen, United States measurement, ought to measure the same as English measurement, and when full, should of course carry the same, and if of the same model, would carry the same amount of any description of cargo. Every vessel built within the United States, or owned by a citizen after 1st January, 1865, shall be measured and registered in the manner hereinafter provided; also every vessel now owned by a citizen shall be re-measured and re-registered upon her arrival at a port of entry in the United States, and prior to her departure therefrom in the same manner as hereinafter described. Any vessel

built within the States, after the passage of this act, may be measured and registered in the manner herein provided.*

The register shall express the vessel's length, breadth, depth, and height under the third or spar deck, which shall be ascertained in the following manner : The tonnage deck, in vessels having three or more decks to the hull, shall be the second deck from below ; in all other cases the upper deck of the hull is to be the tonnage deck. The length from the fore part of the outer planking, on the side of the stem, to the after part of the main stern-post of screw steamers, and to the after part of the rudder-post of all other vessels measured on the top of the tonnage deck shall be accounted the vessel's length. The breadth of the broadest part on the outside of the vessel shall be accounted the vessel's breadth of beam. A measure from the under side of tonnage deck plank, amidships, to the ceiling of the hold, (average thickness) shall be accounted the depth of hold. If the vessel has a third deck, then the height from the top of the tonnage deck plank to the under side of the upper deck plank shall be accounted as the height under the spar deck. All measurements to be taken in feet and fractions of feet ; and all fractions shall be expressed in decimals.

The register tonnage shall be the vessel's entire internal cubical capacity in tons of 100 feet each, to be ascertained as follows : Measure the length in a straight line along the upper side of the tonnage deck, from the inside of the inner plank (average thickness) at the side of the stem to the inside of the plank on the stern-timbers (average thickness), deducting from this length what is due in the thickness of the deck to the rake of the bow, and what is due to the rake of the stern-timber, and also what is due to the rake of the stern-timber in one-third of the round of the beam : divide the length so taken into the number of equal parts required by the following table, according to the class in such table to which the vessel belongs.

TABLE OF CLASSES. CLASS 1.—Vessels of which the tonnage length according to the above measurement is 50 feet or under, into six equal parts. CLASS 2.—Above 50 and not exceeding 100 feet long, into eight equal parts. CLASS 3.—Above 100 feet long, and not exceeding 150, into ten equal parts. CLASS 4.—Above 150 feet, and not exceeding 200 feet long, into twelve equal parts. CLASS 5.—Above 200 feet, and not exceeding 250 feet long, into fourteen equal parts. CLASS 6.—Above 250 feet long, into sixteen equal parts.

Then, the hold being sufficiently cleared, find the transverse area at each point of division of the length as follows :—

Measure the depth at each point of division from a point at a distance of one-third of the round of the beam below such deck, or in case of a break, below a line stretched in continuation thereof, to the upper side of the floor timber, at the inside of the limber strake, after deducting the average thickness of the ceiling, which is between the bilge planks and limber strake ; then, if the depth at the midship division of the length does not exceed 16 feet, divide each depth into four equal parts : then measure the inside horizontal breadth at each of the three points of division, and also at the upper and lower points of the depth, extending each measurement to the average thickness of that part of the ceiling which is between the points of measurement ; number these breadths from above

* The author has to thank Mr. FREDERICK CHASE, Washington, W.C., U.S.A., for sending spontaneously to him (8th January, 1865) a copy of the Instructions as to the Admeasurement of Tonnage.

(the upper breadth one, and so on down to the lowest); multiply the second and fourth by four, and the third by two; add these products together, and to the sum add the first breadth and the last, or fifth; multiply the quantity thus obtained by one-third of the common interval between the breadths, and the product shall be deemed the transverse area; but if the midship depth exceed 16 feet, divide each depth into six equal parts instead of four, and measure as before directed, the horizontal breadths at the five points of division, and also at the upper and lower points of the depth; number them from above as before; multiply the second, fourth, and sixth by four, and the third and fifth by two; add these products together, and to the sum add the first breadth and the last, or seventh; multiply the quantities thus obtained by one-third of the common interval between the breadths, and the product shall be deemed the transverse area.

Having thus ascertained the transverse area at each point of division of the length as required above, ascertain the register tonnage as follows:—

Number the area successively 1, 2, 3, &c., No. 1 being at the extreme limit of the length at the bow, and the last number at the extreme limit at the stern; then whether the length be divided according to the table into six or sixteen parts, as in classes one and six, or any intermediate number, as in the other classes, multiply the second and every even-numbered area by four, and the third and every odd-numbered area (except the first and last) by two; add these products together, and to the sum add the first and last, if they yield anything; multiply the quantities thus obtained by one-third of the common interval between the areas, and the product will be the cubical contents of the space under the tonnage deck; divide this product by 100, and the quotient, being the tonnage under the tonnage deck, shall be deemed to be the register tonnage, subject to the additions hereinafter mentioned.

If there be a break, a poop, or any other permanent closed-in space on the upper decks, or on the spar deck, available for cargo or stores, or for the berthing or accommodation of passengers or crew, the tonnage of such space shall be ascertained as follows:—

Measure the internal mean length of such space in feet, and divide it into an even number of equal parts, of which the distance asunder shall be most nearly equal to those into which the length of the tonnage deck has been divided; measure at the middle of its height the inside breadths, namely, one at each end and at each of the points of division, numbering them successively one, two, three, &c.: then to the sum of the end breadth add four times the sum of the even-numbered breadths and twice the sum of the odd-numbered breadths, except the first and last, and multiply the whole sum by one-third of the common interval between the breadths; the product will give the mean horizontal area of each space; then measure the mean height between the plank of the decks, and multiply by it the mean horizontal area; divide the product by 100, and the quotient shall be deemed to be the tonnage of such space, and shall be added to the tonnage under the tonnage deck, ascertained as aforesaid.

If a vessel has a **third deck**, or **spar deck**, the tonnage of the space between it and the tonnage deck shall be ascertained as follows:

Measure in feet the inside length of the space, at the middle of its height, from the plank at the side of the stem to the plank on the timbers at the stern, and divide the length into the same number of equal parts into which the length of the tonnage deck is divided; measure (also at the middle of its height) the inside breadth of the space at each of the points of division, also the breadth of

the stem and the breadth at the stern ; number them successively one, two, three, &c., commencing at the stem ; multiply the second and all other even-numbered breadths by four, and the third and all odd-numbered breadths (except the first and last) by two ; to the sum of these products add the first and last breadths ; multiply the whole sum by one-third of the common interval between the breadths, and the result will give, in superficial feet, the mean horizontal area of such space ; measure the mean height between the plank of the two decks, and multiply by it the mean horizontal area, and the product will be the cubical contents of the space ; divide this product by 100, and the quotient shall be deemed to be the tonnage of such space, and shall be added to the other tonnage of the vessel, ascertained as aforesaid. And if the vessel has more than three decks, the tonnage of each space between decks, above the tonnage deck, shall be severally ascertained in manner above described, and shall be added to the tonnage of the vessel, ascertained as aforesaid.

In ascertaining the tonnage of *open* vessels, the upper edge of the upper strake is to form the boundary line of measurement, and the depth shall be taken from an athwart ship line, extending from upper edge of said strake at each division of the length.

The register of the vessel shall express the number of decks, the tonnage under the tonnage deck, that of the between decks, above the tonnage deck ; also that of the poop or other enclosed spaces above the decks, each separately. The total registered tonnage shall be deeply carved or otherwise permanently marked on the main beam, and shall be so continued ; and if it at any time cease to be so continued, she shall no longer be recognized as a registered United States' vessel.

The *charge* for the measurement of tonnage and certifying shall not exceed one dollar and fifty cents for each transverse section under the tonnage deck ; three dollars for measuring each between decks above the tonnage deck ; and one dollar and fifty cents for each poop, or closed-in space available for cargo or stores, or for the berthing or accommodation of passengers, or officers and crew, above the upper or spar deck.

1251. **The Danube.** Table showing the proportion between the ton register English and the measures adopted in other countries for gauging vessels.

Vessels of.		Factor.*		Vessels of.		Factor.*	
		tons.	lasts.			tons.	lasts.
Austria	0'82			Greece	0'76		
France	1'00			Hamburg		2'77	
Italy	0'89			Hanover	0'98	2'25	
Turkey			†	Holland	0'89	1'75	
Prussia	0'98	1'50		Lubeck		1'89	
Russia	1'08	1'89		Mecklenburg ...	1'09	2'44	
America (U.S.)	1'00			Norway	0'98	2'08	
Belgium	0'95	1'81		Oldenburg	0'96	1'50	
Bremen		1'89		United Princi-			
Denmark	1'02	1'96		palities	1'00	†	
Spain	1'00			Sweden	1'02	1'98	

* Factor by which the unit of measure in each country is to be multiplied.

† One English ton equal to 61'53-100 kilos of Constantinople.

‡ One English ton equal to { 4'82-100 kilos of Galatz.
3. 1-100 „ of Braila.

Steam Ships. In calculating the dues payable at the Sulina Mouth, the Board of Trade (8th May, 1863) deduct for engines and coal bunkers 37 $\frac{1}{2}$ cent. from paddle-wheel, and 32 $\frac{1}{2}$ cent. from screw steamers.

1252. **TORTOISE SHELLS.** Bengal, Madras, and Bombay ton 50 cubic feet. A Surat maund 37·33 lbs. A box, containing one pecul of Chinese tortoise shell, measures nine feet; of these six on an average go to a ton of 50 cubic feet.

1253. **TRAGACANTH**, a species of gum exuding from a thorny shrub in Persia, Crete, and the Levant, flowering from May till July; a case contains about 2 $\frac{1}{2}$ cwt.

1254. **TRANSHIPMENT.** It is not binding on all occasions to tranship cargo. In case of constructive total loss, the master is not bound to repair his ship. So with a vessel sunk in deep water, with a cargo on board; the ship and cargo may be in such a state as not to repay the cost of raising, and she had better be left where she is,—at the bottom of the sea. The shipowner is bound to use all reasonable care in fulfilling his contract by conveying the cargo to its destination, but is not bound to ruin himself, in order to do so. *Jessie Miller, HAYDORN v. BIBBY, C.E.* 1st March and 11th July, 1855.

1255. **TRIM.** The trim of a merchant ship is, of course, very much governed by the nature of her cargo, and by the mode in which it is stowed.

1256. **Deck and Load Lines.** Every British ship, except under 80 tons register, employed solely in coasting, fishing, or as a yacht, shall be permanently and conspicuously marked with deck lines, 12 inches long and 1 inch wide, painted longitudinally on each side amidships, showing each deck that is above the water; the upper edge of line level with upper side of deck plank next to the waterways to be white or yellow on dark ground. See sec. 25 of Act 1876.

1257. **Load-lines on foreign-going British ships** same as above. Master shall before entering his ship outward from the United Kingdom, or as soon after as may be, mark on each of her sides amidships, or as near thereto as possible, in white or yellow, a circular disc 12 inches in diameter, with a horizontal line 18 inches long drawn through its centre. Centre of disc shall be the maximum load-line in salt-water to which the ship shall be loaded for that voyage.

When entering outwards, he shall give statement in writing of distance between centre of disc and upper part of each deck-line, in default of so doing the collector can refuse to enter the vessel.

A copy of this document to be in the crew's articles of agreement before they sign them. No crew to be entered until this is done.

It is also to be entered in the official log book. The marks shall not be altered until her next return to the United Kingdom. See sec. 26 of Act of 1876.

1258. Coasting vessels (except under 80 tons) shall be marked with a disc and line. The master shall give a statement to the Custom-house once in 12 months, failing to do which he will incur a penalty not exceeding £100. When once so marked he shall not alter it without notice to Custom-house. See sec. 27 of Act 1876.

1259. An owner or master of a British ship who neglects to cause his ship to be marked, or who allows the centre of the disc to be submerged in salt-water, or any person who conceals, removes, or alters, or obliterates any of these marks, except to escape from an enemy, shall for each offence incur a penalty not exceeding £100. See sec. 28 of Act 1876.

1260. If any mark required by Act of 1876, is in any respect inaccurate so as to mislead, the owner will be liable to a penalty not exceeding £100.

1261. **Draught of Water.** Ships of equal burthen, but of unequal form, when bound on the same voyage, will often require cargo or ballast materially different in quantity; the proportion being always less or more according to the sharpness or flatness of the bottom, called by seamen the flat and rising floor. Usually ships swim considerably by the stern when light; the centre of gravity of lading is, therefore, obliged to be before the centre of buoyancy. Generally, they will not carry sufficient sail till laden so that the surface of the water reaches nearly to the extreme breadth amidships. The Emigration Commissioners require a ship to have a side out (from the water's edge to the covering board) of at least one-third of her entire depth of hold.

1262. Some authorities contend that no vessel bound on any over-sea voyage, should be loaded beyond that part of immersion which will present a clear side out of the water, when upright, of three inches to every foot depth of hold, measured amidships, from the height of the deck at the side to the water. Others consider that over-sea ships should have one-fifth to one-fourth, and coasting vessels one-sixth to one-fifth clear to their depth of hold. In loading grain at New York and Quebec, the rule is that the draught must be regulated by the depth of the hold, allowing three inches to every foot depth of hold, measured from lowest line of sheer of deck amidships to the water, when upright.

1263. **Freeboard.** The Old Rule laid down by LLOYD'S for free-board in midships from top of deck to load-line, is 3 inches to

a foot of depth in hold ; in summer months, $2\frac{1}{4}$ inches, but if this rule were deemed safe for a vessel of a certain breadth and depth, 200 feet long, the same could not be reasonably applied to a ship 300 feet long and of the same breadth and depth. The Liverpool Underwriters' Association have adopted a scale, which is, however, subject at all times to the judgment of the surveyor, who is influenced by the age and class of the vessel, her form, rise of floor, amount of sheer, closed-in spaces on deck as poop, spar deck, intended voyage, the season, and nature of cargo, &c., and which scale is as follows :—

Depth of Hold.	Dry Side, Iron Vessel.	Dry Side, Wood Vessel.	Depth of hold.	Dry Side, Iron Vessel.	Dry Side, Wood Vessel.
ft.	ft. in.	ft. in.	ft.	ft. in.	ft. in.
10	1 10	1 10	18	4 0	4 6
11	2 1	2 $1\frac{1}{4}$	19	4 4	4 11
12	2 4	2 5	20	4 9	5 4
13	2 7	2 $8\frac{1}{4}$	21	5 2	5 $9\frac{1}{4}$
14	2 10	3 $0\frac{1}{2}$	22	5 7	6 $2\frac{1}{2}$
15	3 1	3 $4\frac{1}{2}$	23	6 0	6 $8\frac{1}{4}$
16	3 4	3 $8\frac{1}{2}$	24	6 6	7 $2\frac{1}{2}$
17	3 8	4 $1\frac{1}{4}$	25	7 0	7 $8\frac{1}{4}$

It is suggested by one authority that the most correct method would be to deal with the registered tonnage, or the internal capacity of the vessel, and that for a cargo properly stowed, composed wholly of railway iron, chairs, or pig iron, that once-and-a-half of the registered tonnage, would be a fair cargo. For dead-weight and measurement cargoes, *one-and-three-quarters* of the registered tonnage might be admitted, and for lighter cargoes, *twice* the register tonnage might be taken on board.

Another authority doubts the practicability of applying any general rule, except such an one as this : that a *common measure* of stability should be arrived at, and a range indicated above and below which should be considered as extremes, and out of the pale. As this measure would be affected very much by different cargoes, there is, of course, a difficulty in the way of any particular application of it. He believes it to be a sounder way to mark limits of safety than adopting a fixed proportion of displacement, and that every type of vessel must be a law to itself, regulated in reference to the form, dimensions, &c., of the vessel to which such limit of flotation has to be applied.

A shipbuilder of great experience says, that a good designed ship ought to have three inches side, counting from top of deck plank to water-line, for every foot immersed, but such rule depending upon the construction of the ship ; for instance, a vessel of a light draught

of water, being designed for a certain purpose, ought in no case to go to sea with less than a 3 feet 9 inches side at the lowest point. A 7-feet spar-decked vessel he considered safe when having 2 feet side from top of plank on main deck to the water-line. With a cargo wholly composed of *iron*, a ship ought to have 4 inches side per foot immersed, and two-thirds of the cargo stowed in a parallel line, with the meta centre, or, in other words, well up in the hold to make her seaworthy.

Another shipbuilding firm give it as their opinion, that for spar-decked vessels (flush deck ships they say, especially steamers, scarcely exist at the present time, or at least none are now being built) the old rule of having a clear side of one-fourth the depth of hold, is a fair and reasonable one.

A third shipbuilder says—All *flush-decked steamers*, or steamers with raised quarter-decks or short poops, to have a clear side of $2\frac{1}{2}$ inches for every foot of depth moulded, such clear side to be measured from the surface of the water to the top of the deck plank at the lowest point of the deck in ordinary trim, which point might be assumed to be one-fourth of the length from the stern. In steamers with *long full poops* coming to the fore end of the engine space, the above clear side to be measured from the top of the main deck plank at the fore end of the said poop. Steamers with *complete spar decks* not to be loaded above the scuppers; or say, not above a line one foot below the top of the deck plank of the main or lower deck.

A fourth builder gives it as his opinion, that the depth of side out of the water should be at least 2 inches to every foot of the depth of hold in summer, and $2\frac{1}{2}$ inches in winter; and for a spar-decked vessel 3 and $3\frac{1}{2}$ inches respectively, according to the season.

A nautical authority, whose opinion is entitled to some consideration, considers that a vessel *without a spar deck*, when fully laden, should have a clear space of $2\frac{1}{2}$ inches from water to upper edge of main deck (at centre frame) to every foot depth of hold. With a *spar deck*, depth of which add to depth of main hold, and leave a clear space from water line to upper edge of the lowest surface of spar deck (at centre frame) of $4\frac{1}{2}$ inches to every foot depth of hold, including spar deck. (The above refers to first-class vessels floating in salt water, with dead-weight properly divided.)

Another nautical authority of experience in steam-ships says:—“What is a fair side for a laden steamer?” I would at once say that, as a broad rule, two inches clear side for every foot depth of hold amidships would suffice for any steamer of ordinary propor-

DRAFT OF FOREIGN SHIPS REDUCED TO ENGLISH FEET.

Standard.	Alexandria.		Amsterdam.		Antwerp.		Denmark and Norway.		France.		Greece.		Hamburg.	
inch.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
3	0	3.733	0	2.79	0	2.80	0	3.10	0	3.30	0	3.25	0	2.85
6	0	7.466	0	5.58	0	5.60	0	6.20	0	6.60	0	6.50	0	5.70
9	0	11.200	0	8.79	0	8.40	0	9.30	0	9.90	0	9.75	0	8.55
feet.														
1	1	3.00	0	11.14	0	11.20	1	0.40	1	1.20	1	1.00	0	11.40
2	2	6.00	1	10.28	1	10.40	2	0.80	2	2.40	2	2.00	1	10.80
3	3	9.00	2	9.42	2	9.60	3	1.20	3	3.60	3	3.00	2	10.20
4	4	12.00	3	8.56	3	8.80	4	1.60	4	4.80	4	4.00	3	9.60
5	5	15.00	4	7.70	4	8.00	5	2.00	5	6.00	5	5.00	4	9.00
6	6	18.00	5	6.84	5	7.20	6	2.40	6	7.20	6	6.00	5	8.40
7	7	21.00	6	5.98	6	6.40	7	2.80	7	8.40	7	7.00	6	7.80
8	8	24.00	7	5.12	7	5.60	8	3.20	8	9.60	8	8.00	7	7.20
9	9	27.00	8	4.26	8	4.80	9	3.60	9	10.80	9	9.00	8	6.60
10	10	30.00	9	3.40	9	4.00	10	4.00	10	12.00	10	10.00	9	6.00
11	11	33.00	10	2.54	10	3.20	11	4.40	11	13.20	11	11.00	10	5.40
12	12	36.00	11	1.68	11	2.40	12	4.80	12	14.40	12	12.00	11	4.80
13	13	39.00	12	0.82	12	1.60	13	5.20	13	15.60	13	13.00	12	4.20
14	14	42.00	13	11.48	13	0.80	14	5.60	14	16.80	14	14.00	13	3.60
15	15	45.00	14	10.62	14	0.00	15	6.00	15	18.00	15	15.00	14	3.00
16	16	48.00	15	9.76	15	0.80	16	6.40	16	19.20	16	16.00	15	2.40
17	17	51.00	16	8.90	16	1.60	17	6.80	17	20.40	17	17.00	16	1.80
18	18	54.00	17	8.04	17	2.40	18	7.20	18	21.60	18	18.00	17	1.20
19	19	57.00	18	7.18	18	3.20	19	7.60	19	22.80	19	19.00	18	0.60
20	20	60.00	19	6.32	19	4.00	20	8.00	20	24.00	20	20.00	19	0.00
21	21	63.00	20	5.46	20	4.80	21	8.40	21	25.20	21	21.00	20	11.40
22	22	66.00	21	4.60	21	5.60	22	8.80	22	26.40	22	22.00	21	10.80
23	23	69.00	22	3.74	22	6.40	23	9.20	23	27.60	23	23.00	22	10.20
24	24	72.00	23	2.88	23	7.20	24	9.60	24	28.80	24	24.00	23	9.60

3.733= $1\frac{1}{3}$ nearly. 7.466= $7\frac{1}{2}$ nearly. 11.200= $11\frac{1}{5}$ or $11\frac{1}{4}$.

tions; and that a steamer so loaded would be perfectly seaworthy in any weather, if properly constructed. By ordinary proportions, I mean $7\frac{1}{2}$ times the breadth in length, and two-thirds of the breadth in depth, and with a good sheer.

The necessity for a line of extreme loading is admitted by all parties, and your committee venture to suggest that, in the event of the Government not approving of any of the above suggestions, or seeing fit to fix a basis for vessels hereafter to be built, that such line might be determined by the builder, in conjunction with the surveyor of LLOYD'S, or to the Liverpool Underwriters' Association, under whichever inspection built, together with the local surveyor of the Board of Trade, thus representing the shipowner, the underwriter, and the Government. In the event of any disagreement

DRAFT OF FOREIGN SHIPS REDUCED TO ENGLISH FEET.

Standard.	Italy.		Mecklenburg.		Portugal.		Rhineland.		Spain.		Sweden.	
inch.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
3	0	3'42	0	2'94	0	3'24	0	3'10	0	2'70	0	2'92
6	0	6'84	0	5'88	0	6'47	0	6'20	0	5'40	0	5'84
9	0	10'26	0	8'82	0	8'71	0	9'30	0	8'10	0	8'76
feet.												
1	1	1'68	0	11'88	1	0'94	1	0'40	0	10'80	0	11'68
2	2	3'36	1	11'76	2	1'88	2	0'80	1	9'60	1	11'36
3	3	5'04	2	11'64	3	2'82	3	1'20	2	8'40	2	11'04
4	4	6'72	3	11'52	4	3'76	4	1'60	3	7'20	3	10'72
5	5	8'40	4	11'40	5	4'70	5	2'00	4	6'00	4	10'40
6	6	10'08	5	11'28	6	5'64	6	2'40	5	4'80	5	10'08
7	7	11'76	6	11'16	7	6'58	7	2'88	6	3'60	6	9'64
8	8	1'44	7	11'04	8	7'52	8	3'20	7	2'40	7	9'44
9	9	3'12	8	10'92	9	8'46	9	3'60	8	1'20	8	9'12
10	10	4'80	9	10'80	10	9'40	10	4'00	9	0'00	9	8'80
11	11	6'48	10	10'68	11	10'34	11	4'40	10	10'80	10	8'48
12	12	8'16	11	10'56	12	11'28	12	4'80	11	9'60	11	8'16
13	13	9'84	12	10'44	13	12'02	13	5'20	12	11'40	12	7'84
14	14	11'52	13	10'32	14	1'16	14	5'60	13	7'20	13	7'52
15	15	1'20	14	10'20	15	2'10	15	6'00	14	6'00	14	7'20
16	16	2'88	15	10'04	16	3'04	16	6'40	15	4'80	15	6'88
17	17	4'56	16	9'96	17	3'98	17	6'80	16	3'60	16	6'56
18	18	6'24	17	9'84	18	4'92	18	7'20	17	2'40	17	6'24
19	19	7'92	18	9'72	19	5'86	19	7'60	18	1'20	18	5'92
20	20	9'60	19	9'60	20	6'80	20	8'00	19	0'00	19	5'60
21	21	11'28	20	9'48	21	7'74	21	8'40	20	10'80	20	5'28
22	22	12'96	21	9'36	22	8'68	22	8'80	21	9'60	21	4'96
23	23	14'64	22	9'24	23	9'62	23	9'20	22	8'40	22	4'24
24	24	16'32	23	9'12	24	10'56	24	9'60	23	7'20	23	4'52

$$3'42=3'96=3\frac{1}{2}. \quad 6'84=6'96=6\frac{1}{2}. \quad 10'26=10\frac{1}{2}.$$

arising between the parties, the County Court Judge of the locality could be empowered to authorise two of the nautical assessors, appointed under the Admiralty Jurisdiction Act, to assist in determining the maximum limit of flotation, and the decision of such body to be submitted to, and approved by, the Board of Trade; and that for vessels built under the inspection of neither of these societies (a very rare exception) the builder and Board of Trade surveyor could determine such limit of flotation, with power to call an assessor as provided in case of any disagreement.

1264. The necessity of sailing all vessels on the line of flotation intended by the builder cannot be too strongly impressed on the attention of masters. Instances have occurred where schooners of 200 tons have entered the port of discharge drawing three feet more

aft than forward, when by the lines of the builder, it never ought to exceed 18 or 20 inches. Some experienced surveyors and stevedores contend that in the stowage of certain cargoes in a ship's hold such as a telegraphic cable, the vertical centre of the weight of such cargoes should fall exactly on the (horizontal) line of flotation of the ship when completely laden.

1265. The cargo should be so disposed that the ship may be duly poised, and maintain a proper equilibrium; to be neither too stiff nor too crank—qualities equally pernicious. If too *stiff*, she may carry much sail, whilst her masts are endangered by sudden jerks and excessive labouring. If too *crank*, she will be unfit to carry sail without the risk of oversetting.

1266. In their general report to the Council, 11th April, 1867, the Institute of Naval Architects say there is a minimum height of freeboard which cannot be safely reduced in sea-going ships of ordinary fitment, and it is desirable to fix this minimum height. Freeboard should be understood to be the vertical height of the upper surface of the upper deck (not spar deck) at the side, amidships, above the load-water line. The proportion of freeboard should increase with the length. One-eighth of the beam is a minimum freeboard for ordinary sea-going ships of not more than five breadths to the length, and $\frac{1}{4}$ of the beam should further be added for each additional breadth in the length of the ship: say,

For a ship of 32 feet beam and	160 feet long	4 feet freeboard.	
For a length of	192	"	5 "
For a length of	224	"	6 "
For a length of	256	"	7 "

The beam remaining the same; but as the addition of a spar deck on long vessels may be considered an equivalent or substitute for the increased freeboard required for extra length, a complete spar deck would leave the freeboard of these extra lengths at the original height of four feet.

1267. **Load Displacement.** The Newcastle and Gateshead Chamber of Commerce, in December, 1869, in reference to the absence of any provision in the Merchant Shipping and Navigation Bill, 1869-70, for determining the maximum load-line of ships and steamers, say—while fully sensible of the difficulty of laying down any arbitrary regulation, your Committee would bring before your notice various rules which exist, and some opinions on this point, obtained by them from eminent shipbuilders and practical authorities of this district, whose views are entitled to the greatest consideration.

1268. American LLOYD'S Register, 1868. The limit of local displacement is subject to conflicting opinions between shipowners and underwriters. The former are very sensitive with regard to a stipulated limit of load draught, which if established, would produce many annoyances. We think the requirements might be realized without being detrimental to their interests. That vessels of different proportion, model, or build, may retain their buoyant qualities, carrying weights the capacity for holding bulk, and the capability for carrying weight, must be recognised as distinct elements. We suggest the load draught to be regulated by the depth of hold, the required side out when loaded to be measured from the water, up to the side, even with the lowest line of sheer of spar deck. Vessels having an additional deck put on after construction, the depth of hold to be measured from original deck.

	Depth of hold in feet.	In. to foot of depth.	Side out when loaded.
	30	4	10 ft. 0 in.
SCALE FOR SHIPS OF 2 OR 3 DECKS. }	27	3½	7 10½
	25	3½	6 11½
	20	3	5 0
	12	2½	2 8
SINGLE DECK VESSELS. }	11	2½	2 3½
	10	2½	1 10½
	9	2	1 6
	8	1½	1 0

1269. Mr. HECKFORD, Essex, states in relation to the density of the water of Calcutta, which is 110 miles up the Hoogly from Saugor Point, and 114 from Saugor Roads, at the entrance to the river in the Bay of Bengal, taking a first-class ship of 1,000 tons drawing 20 feet as a guide, the difference of immersion in the fresh-water off Calcutta, and salt-water during 12 months in the year is as follows :—

Months.	Fresh-water off Calcutta.	Salt-water or Saugor Roads.	Months.	Fresh-water off Calcutta.	Salt-water or Saugor Roads.
Jan.	20 ft. 4½ in.	20 ft.	July ...	20 ft. 4½ in.	20 ft.
Feb.	20 4½	20	Aug. ...	20 6 to 6½	20
March ...	20 4	20	Sept. ...	20 6 to 6½	20
April ...	20 3½	20	Oct. ...	20 6 to 5½	20
May	20 3½ to 3¾	20	Nov. ...	20 4½	20
June	20 3¾ to 4½	20	Dec. ...	20 4½	20

By the above it will be seen that in January the difference of immersion between the two places is nearly a quarter of an inch ¾ foot of the whole draught, about ¼ths for April and May owing to the river

water being impregnated with salt-water abreast of Calcutta; and fully Aths in August and September, on account of the freshets, when surface water is to be found in Saugor Roads. These calculations may be taken in some measure as applying to Rangoon and Moulmein—nearly all other ports on the Indian sea-board contain salt-water only.

1270. **Stiffness.** A ship is said to be stiff when her centre of gravity is so placed that she will stand up to a press of canvas. She can, however, be too stiff; for if the centre of gravity be too low, she will roll and strain, and do much damage to her spars and hull.

1271. **Rolling** is that motion by which a ship vibrates from side to side. A ship rolls round an imaginary axis, passing fore and aft through the centre of displacement. The further the centre of gravity is from this line the more violent and jerking the roll; the nearer it is the easier, but not necessarily the less, because if the centre of gravity is raised by heavy weights, like iron ballast in the wings, the roll may be even deeper, though considerably easier than if all the dead-weight was on the keelson; heavy goods should not only be kept out of the extremities of a ship, but out of the wings also. When a steamer is in a river, across the tide, with a freight of cattle, they press against each other, and keep her rolling in the smoothest water. With respect to the formation of the body of a ship, that shape which approaches nearest to a circle is the most liable to roll; for if this be agitated in the water it will have nothing to restrain it, because the rolling about its centre displaces no more water than when it was upright. In a paper by Mr. BARNABY, read at the Institution of Naval Architects, 11th April, 1867, it is stated in relation to her stowage, "that as the character of the ship in this respect varies, so does the number of oscillations she would make per minute, if she were set rolling in still water, by men running across her deck, or other means, and then allowed to come to rest; that is if the ship be crank the number of oscillations per minute will be few; if she be too stiff they will be numerous; but under the same conditions of stowage, the number will be nearly the same whatever the amount of impulse to set her rolling may be."

1272. **Crankness** is caused by not having sufficient ballast, or by disposing the lading so as to raise the centre of gravity too high. This occurs with such cargoes as hemp, and is avoided in some Russian ports, by stowing iron with the lower portion of the cargo. The term crank is applied to ships built too deep in proportion to their breadth, and from which they are in danger of over-setting. Generally speaking, goods lighter than water should not be stowed

in the bottom of the hold, and goods heavier than water above them. The cubic foot of salt-water weighs $64\frac{1}{4}$ lbs. avoirdupois. Heavy goods should be placed in the body and light goods in the ends; this principle may, however, be carried too far with ships of great length, or their sheer may be altered. From the preceding it may be observed that the art of stowing ballast or cargo consists in placing the weights so as to correspond with the vessel's trim and shape: neither too high nor too low: neither too far forward nor too far aft; she may then spread sufficient sail, incline but little, and ply well to windward, and at the same time be easy in her motions.

1273. A ship's stability is increased by keeping the ballast as low as possible, being placed in the full part of the ship; but with regard to rolling the weights may be either too high or too low. A singular and practical illustration of the effects of weights on the rolling of ships is experienced on board the light vessels stationed at the Sand Heads of the river Hoogly, Calcutta. They are 120 feet long by 22 broad, and admeasure about 250 tons. The lights can be seen 15 miles off. The lanterns are very large, and weigh about 22 cwt.; they are in two longitudinal parts, which enclose the mast up which they run for use, 90 feet above the water-line. On the Sand Heads there is frequently a very heavy sea, and whenever this occurs by day the lantern is hoisted, and acts as an effectual counterpoise to the excessive rolling of the vessel. The light vessels are ballasted with about 60 tons of kentledge stowed up in the wings; it is raised six feet from the ceiling.

1274. **Pitching.** The inclination or vibration of a ship lengthways about her centre of gravity, or the motion by which she plunges her head and after-part alternately into the hollow of the sea, is a very dangerous motion, and when considerable, not only retards the ship's way, but endangers the masts, and strains the vessel. When loading ships which "sail by the head," and are, therefore, liable to pitch, it is usual with such goods as grain, to leave a vacant space, well protected, forward. A vessel which pitches much is said to throw her cargo on the breast-hooks.

1275. An experienced master recommends a hurricane deck amidships, with cabins aft and men's berths forward. Stores between. Large ports abreast of the main hatchway to load say cotton, rice, &c., at Calcutta. To load through the hatchway over all. To have water, coal, and every kind of stores under the hurricane deck, then there would be no disturbing the hold on arrival in port to separate the ship's stores from the cargo. It is only a question of how far the hurricane deck should extend. A sea

breaking over the waist of a vessel, where it does mostly, would then run off again, and not remain between the bulwarks as now. Besides, with heavy top-gallant forecastle forward, and poop aft, some ships are difficult to navigate in heavy weather, and twist very much. This mode would place the weights near the centre of gravity, and it would be just as easy to ascend to the hurricane deck as to descend from the quarter to the main deck. Besides which, the injury frequently done to cargo when obtaining water from the hold would be avoided.

1276. **Scending** : the act of a ship when pitching violently into the hollows or intervals of the waves.

1277. **Laboursome**. Subject to labour or to pitch and roll violently in a heavy sea, by which the masts and even the hull may be endangered ; for by a succession of heavy rolls the rigging becomes loosened, and the masts may at the same time strain upon the shrouds with an effort which they are unable to resist ; to which may be added, that the continual agitation of the vessel loosens the joints, and makes her extremely leaky.

1278. **Shifting**. It is absolutely necessary to prevent the possibility of the cargo, or ballast, from *shifting* in the most violent rollings of the vessel : a large proportion of the losses by foundering at sea is caused by insufficient attention to this particular. This applies especially to such goods as wheat and seeds, mixed cargoes, railway bars and carriages, &c.

1279. **Provisions**. When stowing ship's provisions, fuel, &c., with passengers especially, an effort should be made to prevent the daily consumption from disarranging the trim. A ship should be lightened bodily.

1280. Capt. J. M. Boyd, R.N., says :—" There are many disposable weights in the distribution of which we may develop, or fail to develop, or even defeat the design of the builder ; for although a ship when at rest may be apparently in the best sailing trim, it does not follow that she is so in reality. A certain line of flotation might be produced by stowing one-half of the disposable weights in the fore end, and one-half in the other, or the whole might be stowed in the centre. In either case the ship might, according to the copper marks, be correct as to a stipulated measure of draught, but the instant she entered uneven water, the difference in the modes of stowing would be manifest. In the former case she would plunge heavily, strain her fastenings, and break her cordage or machinery, and stop her way ; in the latter all would be the reverse."

TRIMMING COAL, COKE, &c.

NEWCASTLE.—COAL.

	⌘ keel.	s. d.
Single-decked ships not exceeding 20 keel	3	6
Up to 25	4	0
Above 25 keel	4	6
Wanting coals to put to the ends	6	0
Wanting coal levelled.....	5	0
With part cargo on board	4	6
Screw steamers, bunkers included	3	6
Double-decked ships under 20 keel	5	6
Half double-decked ships under 20 keel	4	6
Double-decked ships, 20 keels and above, down one hatchway	6	6
Ditto down two hatchways	6	0
Ditto down three hatchways	5	6
Half double-decked ships, 20 keels and above	5	3
All heavy measure coals at the rate of 7 wagons to the keel, provided the owner is paid freight on that quantity.		

NEWCASTLE.—COKE.

Single-decked vessels loading coke, and taking coal for ballast, not exceeding one-fourth of their burthen, same rates as above.

Single-decked vessels not exceeding 20 keels, with or without cargo.

Not exceeding one-fourth of their ⌘ keel burthen	5	0
Part cargo, if the same is levelled	6	0
Not exceeding 25 keels	5	6
Ditto with part cargo	6	6
Above 25 keels	6	0
Ditto with part cargo	6	0
Double-decked ships	7	6
Ditto with part cargo, if the same is levelled	8	6

This scale is based upon the burthen in keels of coal. Special agreements are to be made for trimming badly-constructed vessels, providing the staitman sanction the same. All convenient hatchways to be made available in trimming at the above rates.

The master to settle for the trimming as soon as the cargo is on board.

WEST HARTLEPOOL.—COAL.

	⌘ keel.	s. d.
Single-decked ships taking 20 keel	3	6
For every keel above 20 and not exceeding 30 keels	4	8
Above 30 and not exceeding 40 keel	6	0
With part cargo on board	4	6
Screw steamers, bunkers included	3	6
Bunkers only, ⌘ chaldron	1	6
Double-decked ships one hatchway	7	0
Ditto two hatchways	6	0
Ditto three hatchways	5	0
Vessels wanting coals shifted to the ends.....	7	6
Levelling	5	0
Vessels stiffening coal to be charged according to labour or agreement. Vessels loading larger measure to pay 6d. ⌘ wagon, or the average of their in-taking of household coal.		

WEST HARTLEPOOL.—COKE.

	⌘ ton.
Single-decked ships taking in up to 30 keel	0 6
Ditto for all above 30 keel	0 9
Double-decked ships	1 0

All vessels wanting coke shifting to the ends, i.e. 6d. ⌘ wagon. All convenient hatchways to be available in trimming at these rates. Any dispute to be referred to and decided by the staitmaster.

SEAHAM.—COAL.

The trimming of all ships entering the port of Seaham harbour will be 3s. 6d. ⌘ keel, except where extra labour is required, when 6d. ⌘ keel additional will be charged; any dispute arising will be settled at the Londonderry Fitting Office. This charge to be regulated by any alteration at the neighbouring ports.

CARDIFF.—COAL.

Ordinary vessels having good hatchways	7 ton.
If half double-decked.....	0 2½
If double-decked	0 3
Double-decked, with one hatchway only	0 3½
Three-decked ships	0 4
Steamers' bunkers	0 6

1281. For a ship is not equally water-borne at *all points*. The fuller midship sections are pressed upwards, whilst the finer extremities are sustained, partly by the water, and partly by their connection with the central body; there is, consequently, a constant tendency in the foremost and after ends to droop.

1282. It can easily be understood that by stowing weights at the extremities not only is the "hogging" tendency encouraged, but (when as in a sea-way, the water has altogether receded from under the fore body, and the wave has passed the centre) the ship will plunge heavily until the bow meets with a material resistance. In this way ships acquire unfairly an unenviable reputation for pitching.

1283. The most infallible mode, however, of preserving trim is by the use of the water-level. A leaden pipe, bent upwards at both ends, is let into the lower deck beams, under the planking, in a fore and aft line, as nearly amidships as the hatchways will permit; the ends are terminated with glass tubes, which are graduated, and for greater security brought up alongside some convenient stanchion. On the tube being filled, the water rises to its level at each end, and the ship's most perfect trim marked off when she is perfectly still.

1284. Any future alteration in the trim, either from expenditure of stores, or variations of wind, are immediately denoted by the levels, and may be at once rectified by the movement of disposable weights, such as shot, any number of men, &c., so that at sea, when it would be impossible to discover the trim by the copper marks, it may be thus ascertained without difficulty; and the effects of alterations in the force of the wind, otherwise imperceptible, are declared by the amount of pressure by the head, indicated by the level.

1285. **TROOPS.** By the Admiralty Regulations for the transport service, (1st June, 1866,)

A **TRANSPORT** is a ship wholly engaged for government service on monthly hire;

A **HIRED TROOP SHIP** or **CONVICT SHIP** is a ship wholly engaged, but not by the month;

A **TROOP FREIGHT SHIP** is not wholly engaged, but carrying also mercantile cargo or passengers;

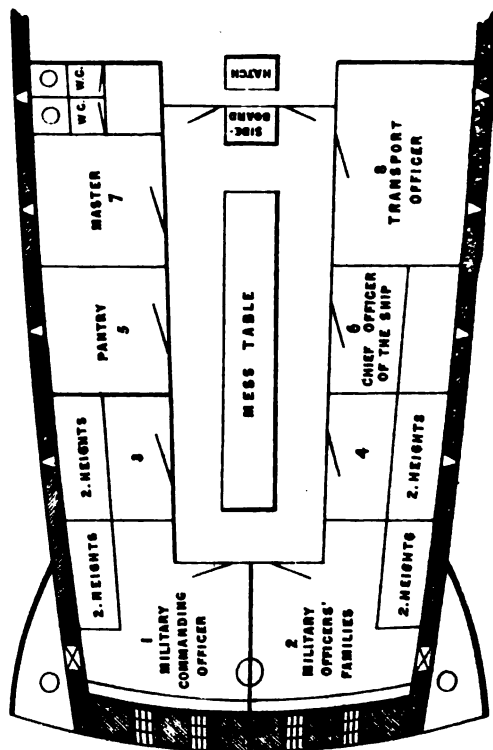
A **STORE FREIGHT SHIP** may be wholly or partially loaded by government; and **STORES** are stores, provisions, and all articles shipped on government account.

Transports must have a height of six feet from deck to beam; in ships conveying horses, seven feet, and 12 in the hold from ceiling to beam. Ballast washed and screened or otherwise approved. Decks two inches thick. Deck houses are objected to. Iron steamers to have water-tight compartments. When not otherwise specified,

STEVENS ON STOWAGE.

POOP.

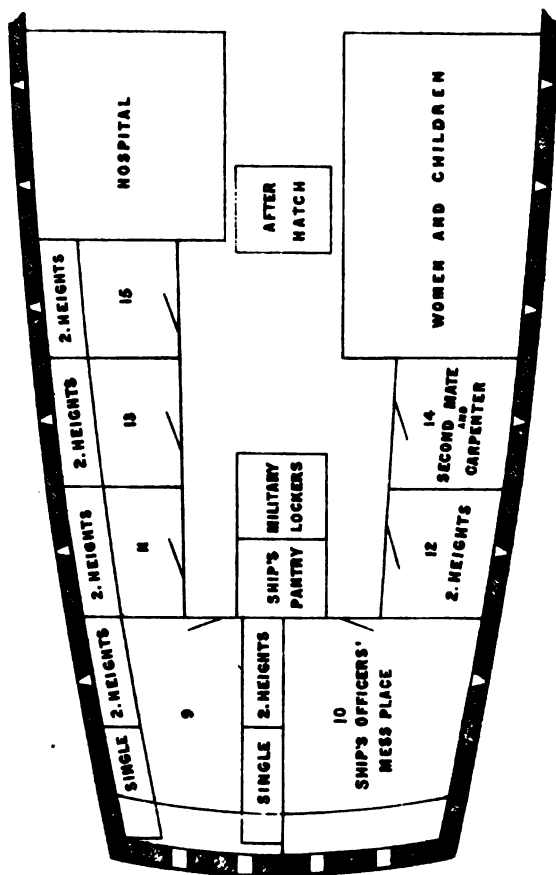
1. Military Commanding Officer
2. Military Officers' Families
3. Military Commanding Officer's Family
if N^o 1 is insufficient
4. Additional Cabin for Ladies, *if N^o 2 is insufficient*
5. Pantry
6. Chief Officer of the Ship
7. Master
8. Transport Officer



TROOP SHIP.

STEVENS ON STOWAGE.

LOWER DECK.



9. *Military Officers.*
10. *Ship's Officers Mess*
11. *Military Officers.*
12. *Military Officers.*
13. *Military Officers.*
14. *2nd Mate and Carpenter.*
15. *Military Officers.*

TROOP SHIP.

measurement stores are rated 40 feet to the ton, heavy stores 20 cwt. In the freighting of **Store ships** the government stipulates for the conveyance of one passenger to every 25 tons of stores, (if required) at the rate of six tons freight for every first-class passenger, four for every second, and three for every third. In the stowage of stores the owners are at their own expense, to employ the necessary stevedores. Ships which have been "salted" must be perfectly dry. In vessels conveying government stores, the quantity of heavy castings, railway iron, &c., must not exceed *half*, and in transports, &c., *one-third* the register tonnage. Special permission is required for the shipment of powder, ammunition or combustibles, matches, guano, petroleum, vitriol, green hides, or other articles of a dangerous or objectionable description, coal not being in casks, whether as cargo or ballast, and horses or cattle.

1286. Ships conveying over fifty **troops** are not to be loaded beyond that point of immersion which will present a clear side out of the water, when upright, of four inches to each foot of registered depth of hold, measured amidships from the underneath part of the deck, at the side, to the waterline. Those with less than fifty troops, or with stores, are to have a clear side of not less than three inches to each foot. In fresh water, the height may be diminished by half an inch to each foot.

1287. **Transports** conveying 100 men are to have ventilating machines on DANK'S or some other principle, and those conveying 50 with a bakehouse, &c., an apparatus for distilling water by NORMANDY or by WINCHESTER, &c.; only half the stock of filtered water will then be required. Of malt 15 ounces, and hops 10 ounces, for each 100 persons for 28 days. A prison for 2 $\frac{1}{2}$ cent. of troops, and leg irons for 3 $\frac{1}{2}$ cent. A lazarette deck extending to the fore part of the after hatchway, platform for hammocks, baggage room, chako room; 'tween decks, &c., painted two coats; head pump, lightning conductor, sufficient scuttles, arm racks, &c.

1288. In **Sailing vessels**, troops must be accommodated below; and in steamers, when the voyage exceeds three weeks; when less (excepting from November to February inclusive) one-fourth may go under cover on deck. The officers' mess place should be under the poop; the commanding officer obtains the aftermost cabin on the port side; the starboard side is for officers' wives and families; the transport officer has the foremost starboard cabin; the master has the port cabin; the chief officer under the poop. The dimensions of a cabin for one officer, 30 feet superficial; for two, 42; 10 additional for every officer in addition: all independent of the bed places, which

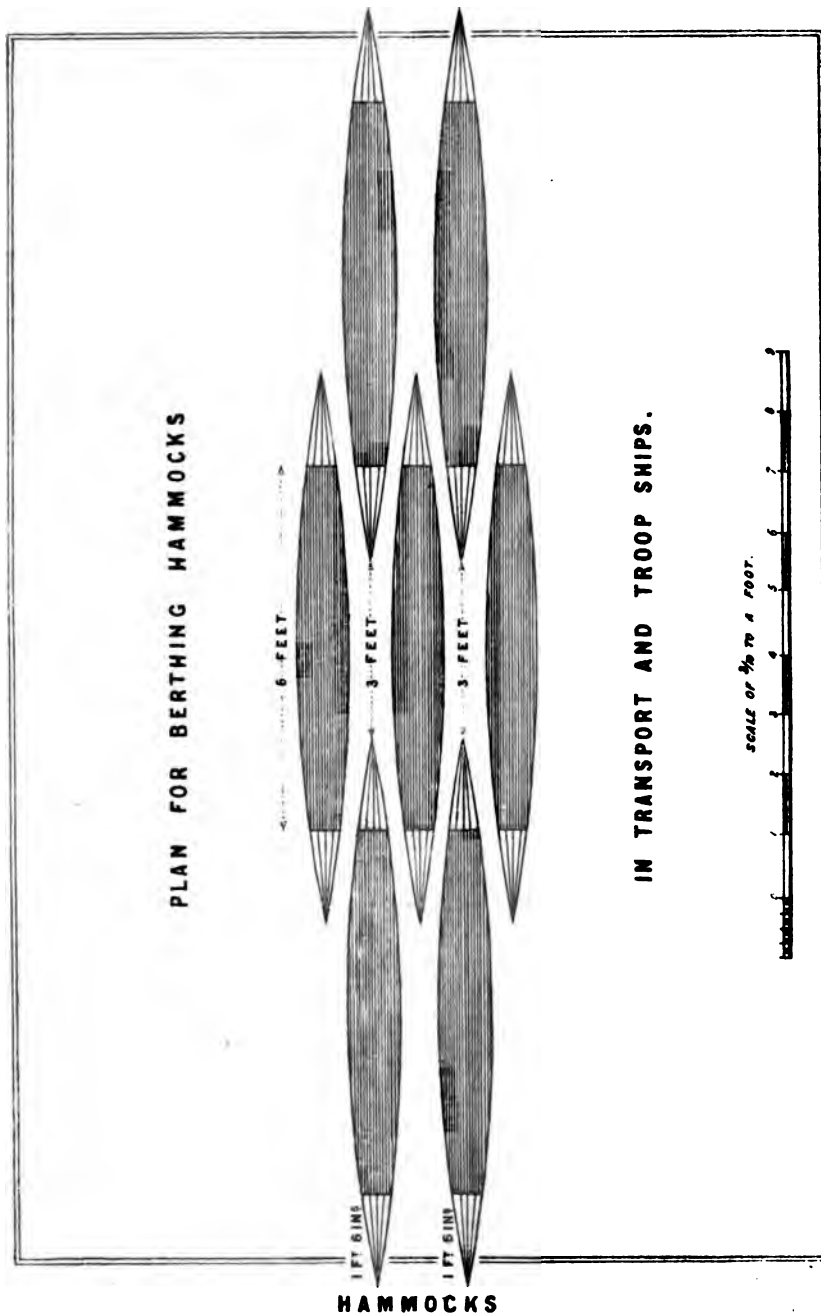
are to be 6 feet long and 27 inches wide in transports; 2 feet wide in hired ships. The standing bed places for one woman and two children under ten, or for two women, are to be 6 feet long and 3 wide. All standing bed places are to be kept 3 inches from the ship's side to preserve them from wet. Hospital accommodation 2 or 3 per cent. of the passengers. The hammocks are to be 6 feet long; each is to have a space 9 feet by 16 inches wide.

1289. The **crews of transports** are to be four to every 100 tons register; with two boys in addition in every ship. Paddle-wheel steamers five men to every 200 tons gross register; screws, three to every 100 tons gross. Engineers, &c., (in addition) one man to every 15 horse-power. Stewards, cooks, and servants are additional. **Convict** ships are to have nine men to every 200 tons register, and two boys additional for every ship; all to be British subjects, who must engage to assist in the infliction of corporeal punishment of the convicts, when required by the surgeon-superintendent. Freight ships are manned like those in the merchant service.

1290. The *smoking* of tobacco on board transports, &c., is forbidden, except on the upper deck, between stated hours. Owners and masters of all ships chartered by the Admiralty are to adopt the most stringent measures to enforce this regulation, and are also to take care that in the stowage of the holds, no accumulation be allowed of oily or greasy oakum, or other combustible materials, which might cause spontaneous combustion; and to warn all persons on board to be very careful of lights, so as to prevent accidents by fire. In transports, &c., these directions will be publicly read to the troops on embarkation, by the military commanding officer, in the presence of the transport officer, if there be one on board; and will be similarly read to the crew by the master of the ship. In convict ships by the surgeon-superintendent. Copies of this article are to be hung up in conspicuous places.

1291. When stowed in government troop ships for disinfecting purposes, **slacked lime** is to be protected from damp, **pearlash** must be in stone jars, well corked or fitted with close stoppers. **Condy's patent fluid**, in quart or pint bottles (printed directions for its use to be placed on board), and **chloride of lime**, in stone jars, placed so as to be protected from damp. For fumigating purposes **sulphuric acid** should be contained in half-pound stoppered bottles, each packed separately in a box, to be secured in its place by tow, and kept standing upright; the strength of the acid to be that commonly known as sulphuric acid, or oil of vitriol. **Per-oxide of manganese**, to be in stone jars.

STEVENS ON STOWAGE.



(60.) **Gunpowder.** When government **powder** or combustibles are shipped *for conveyance*, a magazine or place of security, if necessary, will be built by, and at the expense of the Crown, and, in freight ships the owners will be paid freight on its *external* measurement, and not on the tonnage of the powder or combustibles in it. The materials to be the property of the government, and to be delivered to the officer to whom the powder, &c., is consigned. A magazine will not however, be required for the following quantities, viz :

- I. Powder (alone), 20 feet
- II. Ammunition (alone), 20 feet
- III. Powder and ammunition (stowed in one case), 20 feet
- IV. Combustibles, 20 feet.

Nor will a magazine be required when only 20 feet of combustibles are shipped in the same vessel with only 20 feet of the Articles as Nos. I. to III. The above small quantities may be stowed in a place of security approved by the surveying officers, and may, subject to the regulations of the conservators of the Thames, and of the dock companies, be shipped in any part of the river Thames, the brokers being, however, required to give at least two days' written notice to the Principal-Superintendent of Stores at Woolwich, of the intended date of sailing, and place at which the articles should be put on board.

(61.) When government **powder**, ammunition, or combustibles, for which a magazine is required in compliance with Articles 60, are to be shipped in the Thames, the owners are to give at least two days' written notice, after the construction of the magazine, to the Principal-Superintendent of Stores at the Royal Arsenal, Woolwich, of the date on which she will be ready at Galleon's Reach, or at Gravesend, to receive those articles. Sailing vessels whose draught of water does exceed 18 feet, are to proceed to, and to make fast at, a red mooring buoy, which has been placed there. Other sailing vessels and all steam vessels, are to proceed to, and make fast at, the moorings laid down on the southern side of Gravesend Reach. A steamer towing another vessel must cast off, and leave the ship for a distance of not less than 300 yards during the shipment of powder, &c., and the hatches of the lighters will on no account be raised until the tug has proceeded to that distance, nor until all lights and all fires on board the ship have been extinguished. Before powder, &c., will be shipped on board steam vessels, the furnace fires must be properly banked up, and all lights extinguished. The shipments will be made under the personal directions of the officers of the War Office, who

will deliver the key of the magazine scuttle to the master of the vessel.

(88.) When any quantity of powder, ammunition, or combustibles, exceeding those specified in Article 60, is shipped, *on private account*, under the conditions in Article 8, it must be packed as follows:—Powder in barrels, or other casks, bound with copper or wood hoops; ammunition, such as cartridges, in barrels or other casks, similarly bound, or in boxes or cases fastened with copper nails or brass screws; other combustibles, in boxes or cases, similarly fastened. These stores must be properly secured by the owners, and at their own expense, in a magazine lined with wood, fastened with copper nails, and provided with a copper padlock, &c., for the door. But should only the small quantities above referred to be shipped, they must be packed in suitable cases, fastened as above, and be properly stowed. This regulation, however, is not applicable to vessels in which conveyance may be engaged for only a small quantity of government stores (not exceeding 20 tons weight or measurement), unless such quantity may comprise government powder, ammunition, or combustibles, in excess of the above-mentioned small quantities. No stores are to be placed in the magazine of any hired ship with powder or combustibles.

1292. The following **scale of rates** for the total weight and measurement of the Baggage of Officers and Regiments, is to be strictly adhered to. The first column shows the limit of weight; the second shows the extent of measurement of baggage when packed.

MILITARY OFFICERS—STAFF.

	cwt.	cu. ft.
General Officer in Chief command.....	40	200
General Officer	36	180
Brigadier-General	30	150
Colonel on the Staff	26	130
Adjutant or Quartermaster-General in India.....	36	180
Deputy Adjutant or Deputy Quartermaster-General.....	30	150
Assistant Adjutant or Assistant Quartermaster-General	26	130
Deputy Assistant Adjutant or Deputy Assistant Quartermaster-General	20	100
Military Secretary, when a Field Officer or at the head of his department	20	100
Military Secretary (not being a Field Officer) or Assistant Military Secretary. Aide-de-Camp, Brigade-Major	14	70

General and other Staff Officers, Cavalry Officers, and Mounted Officers of Infantry, when proceeding by water, are to be allowed specially to embark, besides the above, the equipment for each horse

MILITARY OFFICERS—REGIMENTAL.

		cwt.	cu. ft.
CAVALRY† and INFANTRY.	Field Officer.....	18	90
	Captain	12	60
	Subaltern	6	30
	Paymaster†	*	*
	Adjutant,‡ Riding Master	6	30
	Quartermaster‡	8	40
	Surgeon-Major or Surgeon, Assistant Surgeon, Veterinary Surgeon	*	*
ARTILLERY or ENGINEERS.	Field Officer.....	27	135
	Captain ..	18	90
	Subaltern	12	60
	Paymaster†	*	*
	Adjutant‡ { If a Captain	18	90
	{ If a Subaltern	12	60
	Riding Master, Quartermaster‡.....	12	60
	Surgeon-Major or Surgeon, Assistant Surgeon, Veterinary Surgeon	*	*
CAVALRY or INFANTRY.	Hospital Stores	18	90
	Armourers' Stores	6	30
	Regimental Mess	50	250
CAVALRY.	Troops, each, if above 50 rank and file ...	12	60
	Ditto, if 50 rank and file and under	6	30
	Saddlers' Apparatus	6	30
	Articles of Sword or Lance Exercise	7	35
INFANTRY.	Companies, each, if above 50 rank and file	18	90
	Ditto, if 50 and under	12	60
	School	3	15
	Band	12	60
	Each Soldier's Wife, including Children.....	1	5

required to be kept by them in the execution of their public duties, and foraged at the public expense, in the following proportion, viz. :

For one horse	10 cubic feet.
For the second and every other horse in addition	5 ditto.

* According to relative rank, with an addition for Medical Officers of one cwt. (or five cubic feet) for professional books, &c.

† Combatant Officers of Cavalry are allowed two cwt. (or ten cubic feet) in addition to the above quantities, for spare saddlery.

‡ The quantity for Paymasters, Adjutants, and Quartermasters, as above, are exclusive of six cwt. (or 30 cubic feet) for the two former, and ten cwt. (or 50 cubic feet) for the latter, if belonging to Cavalry or Infantry, and six cwt. (or 30 cubic feet) if belonging to the Royal Artillery or Royal Engineers, allowed for books and stores in their immediate charge, when such books and stores actually accompany them.

MILITARY OFFICERS—DEPARTMENTAL.

	cwt.	cu. ft.
Major-General	36	180
Brigadier-General	30	150
Colonel	26	130
Lieutenant-Colonel, or Major	20	100
Captain	14	70
Lieutenant or Ensign	8	40

NAVAL OFFICERS.

	cwt.	cu. ft.
Commander-in-chief	40	200
Admiral, Vice-Admiral, Rear-Admiral	36	180
Captain of Fleet, Commodore, Inspector-General of Hospitals and Fleets.	30	150
Captain, Chaplain	26	130
Staff Captain, Deputy Inspector-General of Hospitals and Fleets, Secretary to Commander-in-Chief or Flag Officer, Inspector of Machinery Afloat, Commander, Staff-Commander, Staff-Surgeon, Lieutenant, Master, Surgeon, Paymaster, Chief Engineer ..	18	90
Secretary to Commodore, Naval Instructor, Assist. Surgeon Sub-Lieutenant, Chief Warrant Officer, Second Master, Assistant Paymaster, Engineer, Assistant Engineer, Warrant Officer, and all subordinate officers.....	12	60
	6	30

1293. **Instructions for the Baker.** The troops, women, children, and other government passengers embarked are to be supplied with fresh bread *four times a week*, viz., on Sundays, Tuesdays, Thursdays, and Saturdays. The bread is to be baked every Monday, Wednesday, Friday, and Saturday; but it is not to be issued until the day after, so as not to be eaten new. *Baking is not to be done on Sundays.* The baker is on each occasion to obtain sufficient flour to produce the required quantity of bread; calculating 4 lbs. of flour for 5 lbs. of bread. Bread is to be made of pure flour and yeast, and a little salt and water; no other ingredients whatever are to be added. The bread is to be baked in tins capable of containing a loaf of 3 lbs. each. The oven is to be heated daily, and when not baking bread, may be used for cooking other food. The space appropriated for the oven, and for baking, is to be kept clear for that purpose. Baking utensils to be kept thoroughly clean; when not in use are to be locked up, and the key retained by the baker.

1294. **Horses, Hay, &c.** Horse ships must be fitted with one spare stall for every ten horses. **Forage** for each horse daily : 6 lbs.

oats, 10 lbs. hay, half-peck or $2\frac{1}{2}$ lbs. bran, 6 gallons water, and such quantities of vinegar and nitre as may be required for daily use. When the exigencies of the service may require that **hay** shipped on government account should be carried on the upper deck, great care is to be taken in protecting it from all danger of ignition, and in frequently examining its condition, so as to ascertain whether there be any symptoms of spontaneous combustion. Smoking in its immediate vicinity is strictly prohibited. In steamers the hay must be placed out of the reach of, and protected from, sparks from the funnel.

1295. Table showing the **number of days** for which sea-going ships should be provided with mess rations, medical comforts, water, forage, and necessities for the following voyages :

STATIONS OR PORTS.		Steamers.		Sailing vessels.
		Full Power.	Aux. Power.	
MEDITERRANEAN	Gibraltar	Out.	Out.	Out.
	Malta.....	16	22	28
N TH AMERICA and WEST INDIES	Malta.....	21	29	37
	Newfoundland	21	32	42
	Nova Scotia	21	33	45
	New Brunswick	21	35	48
	Prince Edward's Island	24	37	49
	Canada (Quebec or Montreal)	28	42	56
	Bermuda	24	40	56
	Bahamas	34	45	56
	Jamaica	32	42	56
CENTRAL and S TH AMERICA	Windward and Leeward Islands	30	40	50
	Honduras	36	51	65
	B. Guiana (Berbice, Demerara, Esse- (quibo)	30	40	49
	West Coast (Gambia or Sierra Leone)	27	35	42
AFRICA, &c.	Gold Coast (Cape Coast Castle)	37	47	56
	Ascension and St. Helena	52	65	77
	Cape of Good Hope (C. Town or Simon's Bay) Algoa Bay, East London, or other ports	71	88	105
	Mauritius	82	97	112
INDIA, CHINA, &c.	Ceylon	102	121	140
	Bombay	105	123	140
	Madras	108	124	140
	Calcutta	118	129	140
	Hong Kong	130	149	168
AUSTRALIA, &c.	Sydney, Melbourne, and Tasmania ...	121	139	157
	Freemantle ..	113	130	146
	New Zealand ...	134	151	168

In the foregoing table the sum of the number of days allowed for voyages outward in full-power steamers is 1,602; homeward the number, according to government regulation, 1,628; and out and home, 3,041 days. By auxiliary power, out 1,965, home 1990, and out and home 3,659 days. In sailing vessels, out 2,321, home 2,339, out and home 4,277 days.

1296. In 1855, the Admiralty published instructions for "masters on board H.M. hired Transports, when employed in carrying provisions and victualling stores from one port to another, or for distribution to ships at sea, or in victualling troops or passengers." These instructions say—

"You are on no account whatever to suffer *rum* or other spirituous liquors to be drawn off at any time, or moved from one cask to another, in any place except upon the upper or main deck, and then by daylight only; at all times when lights may be required in the lazaretto, after-hold, or store-rooms, you are to take care that a steady officer attends with good lanterns, strictly forbidding the candles to be taken out; any inattention to these directions—the most rigid compliance with which is so essential to the preservation of the lives and property on board—will subject the ship's freight to a severe mulct, and the offending party will not be allowed to serve in future in any ship chartered by the Lords of the Admiralty. The *fires* should also be extinguished at a fixed period as well as the lights, except those that may be absolutely necessary."

"You are not at any time to allow either *pigs* or poultry to be kept below, and no dogs are to be embarked with the troops or kept on board."

"The 'tween decks are to be frequently *white-washed* with wash of a proper consistency, made with unslaked lime, into which is to be put white copperas, at the rate of one pound to each bushel of lime: it is to be laid on while hot, immediately after it shall have been well mixed."

"If, on the opening of a cask of *salt beef* or *salt pork* for expenditure, it shall be found short of the proper number of pieces by *tale*, or if correct by *tale*, but apparently deficient on the *whole* number of pieces of the proper *weight*, you are to inform the agent thereof, when he will issue his order that all casks of salt meat remaining on board (that form part of the same supply) shall be surveyed as opened for expenditure. The following rule is to be observed, viz.: fourteen pieces of beef cut for 8 lb. pieces, or twenty-eight pieces of pork, cut to 4 lb. pieces, taken out of each of the casks as they rise, and the salt shaken off, are to weigh 112 lbs. avoirdupois. It is, however, to be observed that if in carrying out the above rule it shall be found that there is a surplus in weight instead of a deficiency upon the whole of the meat so weighed, you are to take care to debit yourself with such surplus on your own account."

1297. **The Army Regulations for Troops** (1857), as regards their accommodation in hired transports and freight ships, were as follows:—

The approximate amount of tonnage required for the conveyance of troops is about 270 tons, *n. m.*, to each 100 men; and it is now established that in taking up ships sufficient space be allotted *for all troops to be accommodated below*, but the amount of the accommodation will depend on the number of hammocks which can be hung up.

As many air tubes are to be fitted from the deck and scuttles through the ship's sides as may be necessary for ventilation. Arm-racks are to be fitted between decks, in the manner most convenient, before the fore hatchway.

Spirits. When rum or any other spirit is supplied with the ration, it is to be mixed with at least three parts of water. Should the officer commanding consider it necessary to stop or abate the ration of wine or spirits, it is to be considered as forfeited, and is not to be issued at a subsequent period.

Fire Arms. On the embarkation of troops armed with rifled muskets, the sights of which are liable to injury if placed in racks during the voyage, such arms as are not required for use are to be securely packed in cases.

Windsails. During voyages in all climates, the most beneficial effects are derived from the use of windsails. The master of the transport is desired to have them made immediately, if not already provided, and they are to be constantly hung up. These sails throw a stream of cold air between decks; and it is not an unusual practice amongst the men near the hatchway to tie up the bottom, by which this salutary purpose is defeated. The serjeant of the watch is to be responsible that this irregularity is never committed.

Fumigation. Frequent fumigation is highly material, to prevent mischief from confined air. The following ingredients are required: common salt four ounces, oxide of manganese in powder one ounce, sulphuric acid one fluid ounce, and water two fluid ounces. The water and acid are to be mixed, and then poured over the other ingredients in a basin, which should be placed in a pipkin of hot sand.

1298. **The Army Regulations for Horses**, published in 1857, with regard to their conveyance on board ship, were as follows:

Horses should be kept in a cool state before embarking, and should be put on board rather low in flesh than in too high condition; in which latter state they are more disposed to be fractious and to kick, and are, moreover, more liable to inflammation.

Long, slow, steady work is to be given to horses previous to their embarkation. They are to be kept fasting and without water for some hours, as slinging is more likely to prove injurious when their bellies are distended with food: and they will sooner become reconciled to their change of quarters, and take to their feet on board, when they have been kept fasting previously.

Captains of troops are to arrange their horses on board in the same order as that in which they have been in the habit of standing in their troop stables. Those horses which know one another will both feel better and stand quieter together; a kicker or a vicious horse, should, if possible, be put in a corner stall. The calkings of the hind shoes are to be removed, as they are not needed on board, and in the event of any kicking, do much injury. Great caution is necessary in slinging; the breech band and breast girth must be securely fastened, or, in his struggles in the air, the horse may slip through. He is to be run up at a rapid rate; and after attaining the necessary height, be steadily and carefully lowered down the hatchway; care being taken to have a guide-rope attached to his head-collar (the ship head-collar being invariably put on before the horse is slung), and two or three careful and active men being stationed between decks to see that his head, legs, and tail are not injured in descending to the lower

deck, where a soft bed of straw must be provided for him to alight upon ; and three determined and resolute men are to be ready to receive, and to take off his slings, as on first feeling his legs, unless he is firmly and judiciously handled, he not unfrequently plunges and kicks violently.

For the first two or three days on board ship, food is to be given rather sparingly, principally bran ; but after the horse becomes reconciled, and as his appetite increases (which it will do after he has been at sea a few days), he is to be more liberally fed ; but a bran mash, or oats and bran mixed, is to be given him at least every other day.

The ship head-collar of canvas is the only safe fastening on board, and there should be two shanks to each collar. The horses's head should be tied rather short than otherwise, and there should be several spare collars on board as well as some good stout canvas for repairs.

Horses can be shifted, and cleaned out and rubbed over, and their feet washed every day, weather permitting ; the dung being drawn up the hatchway in baskets provided for the purpose and thrown overboard, care being taken not to remove any of the shingle with the dung from the horses. Hand-rubbing the legs is of the greatest consequence, and is to be practised every day, when the weather permits, and whilst the horses are being changed over. The provision of the spare stalls on board will allow of this operation being more speedily effected.

Horses are to be slung in smooth weather, and allowed to stand on their legs in rough and stormy weather ; they will rest their legs and feet by throwing their whole weight into the slings, and reposing in that position, while the ship's motion is comparatively easy ; whereas to sling a horse in rough weather (whereby he is taken off his legs) would only have the effect of knocking him about, as the ship rolls to and fro, and would moreover, cause him to be severely chafed by the friction of the side bales and the horse hammock. Horses invariably *resist* the rolling motion, and throw the whole weight of the body when allowed to retain their legs, exactly in the direction contrary to the motion, which, if slung, they would be unable to do.

Horses are not, however, to be placed in slings or horse hammocks, until they have been at sea for a week or ten days, as some horses would be only made uneasy at the attempt to do so ; and some animals will not allow themselves to be slung during the longest voyage.

The sling is to be placed in the centre of the horse's belly, and then the breast-band and breeching fastened to the required length and tightness. The sling should just come up to the height of the animal's belly ; *but no attempt should be made to raise him off his feet*, for when he finds the relief which is afforded by throwing his weight into the slings, he will not be slow in doing so ; indeed with some horses it is necessary to use great quickness in making the ropes fast before they throw their whole weight upon the canvas. In the spring *mares* are generally more troublesome than geldings, and are inclined to kick and rub against the bales, which in such cases are to be well covered with sheepskins, before they have caused injury by rubbing through the skin.

Too much attention cannot be paid to the constant trimming of the wind-sails, which must be kept *full to the wind* ; the fore part of the ship is invariably that in which sickness first exhibits itself among horses, and, therefore, the greatest attention must be paid to throwing a stream of fresh air down the fore hatchway by the wind-sails, the lower ends of which should be carried to within a foot or so of the flooring.

Vinegar is essential to the comfort of the troop horse as well as to that of the men, and is to be freely used; and both the mangers, horses' mouths, noses (and occasionally their docks), should be sponged with vinegar repeatedly, which appears to freshen and delight them. Chloride of lime should be also thrown on the flooring; or, what is better still, to destroy the ammonia arising from the urine, powdered alabaster or gypsum, a few sacks of which are to be provided for purifying the air between decks.

In very rough weather, and if the vessel should labour very much, it will be found necessary to have all the men who can be spared, to stand to their horses' heads, as they will be less frightened when the men are with them.

The air tubes which run through the two decks, and are carried up behind the horses, require also to be constantly looked to; and care is to be taken to see that nothing is permitted to be on the decks which can at all interfere with the thorough passage of the air, or choke the apertures to those ventilators.

In taking horses out of the ship, the same precautions are necessary as when embarking them, and for some days after a long voyage they should be led in hand at a gentle pace, and no weight put on their backs, nor on any account should they be allowed to go out of a walk.

1299. The Queen's Regulations, 1862, contain some instructions for **Royal Naval Officers**, which may be useful to officers in the merchant service, especially when conveying troops, &c.

Cleanliness. As cleanliness, dryness, and pure air are essentially necessary to health, the captain is to use his utmost endeavours to obtain those comforts for the ship's company in as great a degree as possible. The ship is always to be pumped dry, the pump-well is frequently to be swabbed, and a fire let down to dry it (proper precautions being taken to guard against accidents). He is to take care that there is a free passage fore and aft for the water; and those places where, from the ship's trim, there may be a lodgment, are to be baled out and dried: in steam ships especially he is to see that every possible means be taken to insure that the air may circulate freely, and that room be left for a man to get down upon the keelson to clear the limbers of all offensive matter. He is, as frequently as he may deem requisite, to examine himself the state of the holds, and the lower parts of the ship, with the surgeon, and if he should not find them perfectly clean and free from obnoxious smells, he is to cause a thorough examination to be made with a view to detect and remove whatever may be likely to engender disease.

In line-of-battle ships and frigates, if the weather should prevent the ports from being opened for a considerable time, fires are to be made in the stoves, and by means of them and of windsails, the lower decks are to be kept as dry and as well ventilated as possible.

He is to see that the men are properly clothed, in the established uniform, according to the nature of the climate in which they may be serving, that their hair is properly cut and clean,—and that they are, generally, cleanly in their persons and dress. They are never to be suffered to remain in wet clothes, or sleep in wet bedding, when it can possibly be avoided.

The ship's company's bedding is to be aired once a week when the weather will permit, each article being exposed separately to the air by being tied up in the rigging or upon girt-lines. Twice a year their blankets are to be washed

with soap, in warm water ; and once a year the bed tickings are to be washed, and the hair beaten and teased before it is replaced. Chap. 44, sec. 40.

Surgeon. He is not to confine his attention exclusively to patients in the sick berth, or to those who may be actually sick, but to watch every circumstance that may in any degree tend to affect the general health ; and should he suspect indisposition in any man, he is to examine him minutely, although he may not complain ; on finding his suspicion well founded, he is immediately to take such steps as may be necessary, in order that the disease may be more speedily arrested. Upon long cruizes or voyages, when there is not a sufficiency of lemon-juice on board for the whole ship's company, he is to ascertain, by inspection, whether any of the men have symptoms of scurvy ; and should he discover any who show the slightest symptoms of that disease, he is to demand lemon-juice and sugar from the paymaster for their use, as directed in article 1. Chap. 52, sec. 15.

Provisions. Whenever the ship is in port (at home or abroad) the crew are to be supplied, if possible, with fresh meat and vegetables. When fresh meat is received, the captain is always to take care to appoint proper officers to ascertain that it be perfectly good and wholesome, and, if from a contractor, in every way conformable with his contract. In order that a just distribution may be made, and to prevent any occasion of complaint, the fresh meat, if Beef, is to be received in quarters, and if Mutton, in carcasses, conformable to which weight the quarters or carcasses are to be cut up into the usual mess pieces, in some convenient and public part open to the ship's company, and under the particular inspection and supervisal of such officers, petty officers, and non-commissioned officers of marines, as the captain may appoint.

The captain is to cause the ship's cook to be overlooked, in order that the salt meat be properly steeped ; all articles of provisions be cleanly and palatably dressed ; boilers kept clean ; the skimmings of the boilers in which salt meat has been boiled, be on no account given to the men, either to mix with their puddings, or to use in any other manner, as scarcely anything is more unwholesome. When boiled, the meat (whether salt or fresh) is to be delivered to the messes in the customary manner of pricking fairly for it.

In the event of a complaint being made by any of the officers or ship's company, that the salt meat supplied has, from its age or from any inferiority of quality, lost in boiling *more than one half* its original weight, the captain will order enquiry to be made by the surveying officers of the ship, and whether the meat has been properly cut up and cooked ; and if it shall be proved that the daily allowance, or the portion supplied to any particular mess, has fairly lost by boiling *more than one half* the original weight when put into the coppers, the captain will, should he consider an extra allowance necessary, direct the paymaster to issue an additional quantity of raw meat, of the same species, equal to half the original allowance complained of, placing his initials in the proper column of the statement to accompany the paymaster's accounts, as an authority for the total extra issue on each day.

As these extra issues are authorized only for the purpose of making up the dinner allowance, and as they are to be made only when the captain may consider them actually requisite, no portion, either of such extra issues, or of the original ration in respect of which they may be made, is ever to be paid for as savings.

In case of the surveying officers having any difficulty in deciding on the claims for such extra issue, a fair selection of pieces are to be weighed before being put into the coppers, and also after being cooked. Chap. 36, sec. 43.

Water. In government troop-ships on long voyages, the allowance of water is three imperial quarts per man per day. Chap. 21, sec. 33.

Spirits. The surgeon is not authorized to order more than half-a-gill of spirits per diem extra for any person as an extra issue. Chap. 25, sec. 5.

Lemon Juice is to be supplied to any crews in the Royal Navy, at such times, and at such rate, not exceeding half-ounce each, per individual, per day, as the captain may direct, on request of the surgeon. Chap. 25, sec. 11.

1300. TRUNKS, Chinese, are almost entirely of camphor wood ; five in a nest weigh a pecul ; those covered with leather are of inferior wood.

1301. TURMERIC, the root of the *curcuma longa*, imported from Bengal, Java, China, &c. In Bengal it is packed in bags weighing 150 lbs. each, and sometimes in small bags about 28 lbs. each, shipped for broken stowage at a reduced freight. As large quantities of dust escape from them, to the injury of silks, sugars, jute, &c., they ought to be stowed by themselves, and being light, well up in the ship, say in the 'tween decks. Turmeric is often used for blocking up the hold over casks of rum and cases of indigo. The principal season for shipment in the East Indies is during the north-east monsoon. Bengal ton 12 cwt., Madras 14, and Bombay 13 cwt. in bags.

1302. TURPENTINE, a resinous juice extracted from several species of trees ; specific gravity 0.872. The true turpentine tree grows in Spain, and the Southern parts of France, as well as in the island of Chio, and in the Indies. Common turpentine is prepared from different sorts of the pine, and is quite thick, white, and opaque. Venice turpentine is a mixture of eight parts of common yellow or black rosin, with five parts of oil of turpentine. Strasburg turpentine is extracted from the silver fir, it is commonly of a yellowish brown colour, and imported from Germany. In case of breakage be cautious of approaching with a light, as the vapour is highly inflammable ; see naphtha. Tea, coffee, flour, &c. are injured by turpentine, which will render oilcake unfit for consumption, while the cake will cause the casks to leak ; see general cargo, tar, responsibility, &c. The steamship *Lord Royston*, Capt. HUET, was burnt at sea near Belle Isle, 29th September, 1862. The fire commenced under the stokehole plate, under the boilers, and is supposed to have arisen through leakage from some barrels of turpentine stowed in the fore hold. The master lashed the helm to starboard, and the ship made a circle when the engines stopped. All on board, 17, were saved in *La Gazelle*, French schooner, and conveyed to Charente. The Liverpool underwriters (16th April, 1858) state that the vapor from spirits of turpentine (now

brought here in large quantities from the United States) is understood to affect the crew on the passage, even when the forecabin is above deck, and it also occasionally damages other parts of the cargo. Its strength is evidenced, when discharging in the docks, by its effects upon the men, who have often to hurry on deck from a sense of suffocation. The ship *Falcon*, 395 tons, left London in July, and arrived at Singapore 2nd November, 1866. She had a general cargo of gas-coal, gas-pipes, white lead, oils, and tar, with about 2,000 drums of spirits of turpentine, containing 4 to 6 gallons each. When the ship pitched and rolled on the occurrence of the first breeze at sea, the drums worked so that the chimes of one cut through the head of another, and in this manner about 500 gallons were washed out during the passage. The leakage got among the coal and the gas pipes and could not be pumped out. The stench became intolerable, and in the tropics drove the men out of the forecabin, to sleep on deck; their heads swelled, the temples especially, and they were affected with a craving appetite which was never satisfied. The stench was, if possible, worse in the cabins, and more so with the wind aft. New York ton 6 barrels; a barrel 2 to 2½ cwt.

1303. TUTENAG; Chinese zinc or spelter. In the United States it consists of copper eight parts, nickel three, zinc five. Bombay ton 20 cwt.

1304. UNLOADING. When a merchant works out one end of a ship first, and causes water in her to run to the other end, and damages cargo, he is responsible for the loss. If, however, the ship-owner or his servants caused the ship to be so worked, the loss would fall on him. Scrapers or lumpers engaged to clean out a ship are not entitled to the sweepings of cargo, such as loose cowries, found on board in doing it, and the master would not in any case have a right to agree that they shall be so paid, or partly paid, with property belonging to the merchants. If lighters are not ready to receive cargo after due notice has been given, it may be landed, and the Dock Company can enforce the landing charges. After the consignee's first application, he is entitled to receive 24 hours' written notice that the goods are ready for delivery; if any unreasonable delay in the delivery occurs after that, the owner is liable to make good any loss or expense incurred. The *Diana* was reported at the London Custom-house at nine a.m. on a Tuesday, and was to sail again next morning; the Court decided that the master was justified in landing the goods at two o'clock, the consignee to pay wharf expenses. The ship has a right to insist on the discharging hours

being limited (in Great Britain) to from six a.m. to six p.m. except otherwise arranged by mutual agreement, and can demand extra payment for any "dispatch discharge" beyond that time, and also insist on the same without any risk of forfeiture for demurrage. In Charlestown, S.C., no loaded vessel of 200 tons or upwards, is allowed more than 15 days for discharging; ten days under 200, and four days under 100 tons. At New Orleans when cargo is discharged into boats, it continues entirely at ship's risk; no receipts are given, but the master may send a person in charge. At Tarragona and other Spanish ports, the authorities sometimes compel ships to discharge over the stern, involving great loss of time. The shipowner has a lien on the cargo for freight, and can demand to be paid such freight ton by ton as he unloads it.

1305. **Gunpowder.** Common Pleas, Guildhall, 16th February, 1865, before Lord Chief Justice ERLE. *RANEBERG v. THE FALKLAND ISLANDS CO.* Plaintiff shipped on board the *Johanna Oluffa*, carrying a cargo of coal to the Falkland Islands, 400 kegs of gunpowder for another port. On the ship's arrival at Stanley Harbour, the master was informed by the regulations he could not go into port to unload his coal with gunpowder on board, but defendant's company offered him the use of the *Fairy*, in which to store it, while discharging his coal. The master agreed, and the powder was transhipped to the *Fairy*. A day or two after a large emigrant ship called at the Islands to water, and the *Fairy*, as a much smaller vessel, was required to enter the port and procure it for the emigrant ship. This she could not do with the powder on board, and therefore, without consulting plaintiff's master, it was again transhipped to a still smaller vessel the *Lily*. Soon after a storm arose, and she sank with the powder on board. Plaintiff contended that defendants in breach of their duty as bailees had, without consulting or obtaining the assent of plaintiff's master, placed the powder on board an insufficient vessel, by reason whereof it was lost, and sought to recover its value and expenses, £402 12s. Defendants contended that as gratuitous bailees they had taken reasonable care, and that the loss was attributed to the storm and not to any breach of duty. The jury found for plaintiff—damages,—£402 12s.

1306. **URUGUAY, THE RIVER.** The brig *Ariel*, Capt. KNIGHT, 178 tons register, loaded at the isle of Almarine, in the Uruguay, 272 tons bone ash, with 20 tons bones for dunnage. The cargo was brought down the river, 100 miles, in lighters of 50 or 60 tons, and in schooners even of 200 tons, very flat and drawing only 5 or 6 feet; four days loading. The bone ash had been 12 months on the bank and was not hot. She took out 300 tons and 4 lbs. railway iron, and then drew 12½ feet and 11½ feet; with bone ash less. There were no outward **port charges** except 31 dollars at the custom-house. **Pilotage** up to the island and down 10 ounces, £3 5s. to £3 12s. ½ ounce.

1307. **USAGE.** Evidence of usage cannot be admitted to

contradict or alter the effect of a contract, but may be given to show what is really meant. Where a charter-party stipulated that the ship is to load at Trinidad "a full and complete cargo of sugar, molasses, and (or) other lawful produce," evidence of a custom there to load sugar in hogsheads and molasses in puncheons, is admissible, and the custom is sustained in law, though the effect of loading such large packages is not to fill the ship entirely, but to leave much space, termed broken stowage. The owner has it in his power to charge a higher freight, or to introduce into the charter-party, a stipulation as to broken stowage, which would over-rule the custom. *CUTHBERT v. CUMMING*, Exchequer, 8th February, 1854.

1308. **VALONIA** requires from 15 to 20 ϕ cent. of ballast, according to build; sharp vessels may require more. A large carrying ship will ordinarily take her registered tonnage of Smyrna, but eight to ten ϕ cent. less of Grecian. Much depends on whether it is old or new, and according to the amount of pressing; the following may serve as a guide:—

SMYRNA VALONIA.

A Vessel	Carrying	Brought
ton. 119 Reg. N.N.M.	ton. 195 Dead-weight.	ton. 135 Valonia.
152 —	260 —	189 —
157 —	260 —	170 —
161 —		189 —

Valonia is usually dried before shipment; some time must therefore necessarily intervene between the period of its being gathered and shipped. It is thrown in and pressed down with a heavy roller. It generates heat, and ships' beams have been burnt through by valonia stowed too green, as it then contains oil and is usually damp. The compression caused by rolling increases the heat, and for this reason shippers often object to its being rolled, or rolled much, when green. In a general cargo it should be kept at a distance from casks of wine, oil, or other liquids, or leakage will ensue. In loading at Smyrna all expenses are on the ship. Valonia, when rolled, costs, including lighterage, about 3s. ϕ ton; when unrolled, about one-third less. Vessels carrying rolled valonia can take 10 ϕ cent. more than their registered tonnage; when unrolled, about their registered tonnage. Valonia can be rolled at the beginning of May. Coals are taken from alongside the ship free of expense; but discharging iron is

at the expense of the ship, and costs 1s. 4d. ton for lighterage and labour. The chief export is from Smyrna; an inferior sort used in dyeing, comes from the Morea. It is shipped all the year round, the new about January and February; it is termed "new" for two months. When shipped green it weighs out at least 10 4d. cent. less than when dry. The admission or non-admission of the word "rolled" in the charter-party will, therefore, make a very material difference in the freight. Valonia is much used by tanners. **Tonnage.**—Mediterranean ton 20 cwt. When wheat is freighted at 1s. 4d. quarter, valonia in bulk is rated at 6s. 3d. 4d. ton; in bags it pays 20 4d. cent. more than in bulk.

1309. **VAPOUR DAMAGE.** Very frequent and serious loss falls on consignees of the upper parts of cargoes, particularly in vessels laden partly with wheat, Indian corn, or maize, tobacco, oil-cake, &c., by vapour damage arising from turpentine, or other scented goods, stowed in the same vessel. Perfumery, scented articles, drugs, fine oils, teas, coffee, farinas, cutlery, plate, millinery, and stationery, are liable to damage by coming in contact with or being placed near moist goods, damp bales, &c., as the steam they create penetrates every package near, and impregnates its contents with a dampness which greatly deteriorates and sometimes destroys their value. Quantities of cheese from America and Holland are constantly destroyed by being stowed near vapour goods in ill ventilated positions, where heat is produced. Several kinds of Mediterranean fruit have the *ova* of maggots deposited in them before shipment; but these would probably never arrive at maturity if some mode of ship ventilation could be adopted. One importer suggests the possibility of supplying the hold, in damp weather, with air rarified by passing through iron ventilators fitted close to the caboose. If the after hatchways were kept open when practicable, considerable damage might be prevented. Lucifer matches in cases are very likely to impregnate other goods with the odour peculiar to themselves. Heated decks often cause injury to cargo, which is erroneously attributed to heat generated in the goods. Some straw hats, crinolines, &c., were sent from London to Australia, when they were found on opening to be mildewed. A master who was called in to survey, declined to certify, because the boxes were not tinned: he contended that although the bill of lading said they were "lined," and the master had signed in ignorance, the owner was not liable. Another master certified, but when the facts came to the knowledge of the underwriters they refused to pay, and the application was not renewed. It is stated that in cases of this sort when the certificate

is unchallenged, the goods are sold by auction, (ostensibly for the benefit of the underwriters,) and are bought much below their value by the consignee or his agents, to the great loss of the underwriters ; see bale goods and bricks.

1310. VEGETABLE WAX is largely produced in Japan, and is shipped chiefly from Yokohama and Nagasaki. Small quantities of Japanese wax are shipped occasionally at Shanghai. It is packed in boxes, which, with the matting, measure 2 feet 4 inches long, 18 inches broad, and 15 deep, and weigh net 160 lbs., tare 27 lbs., gross 187 lbs. They are stowed the same as boxes of soap from England ; 50 cubic feet go to a ton. In 1863, the *Excelsior*, 462 tons register, Capt. HUNTER, stowed 5,000 boxes in the lower hold, and delivered them in good order in London. Vegetable wax is used for the manufacture of candles.

1311. VELLUM must be protected from dampness and from rats. A roll is five dozen or 60 skins.

1312. VENTILATION. It is of the highest importance to maintain the most full and free ventilation possible, for the preservation of the frame of the ship, whether of iron or wood, for the prevention of injury to the cargo, and for the maintenance of the health of the crew. No distinct instructions can be given which will apply to all cases requiring management, for although by ventilation the moisture of the atmosphere arising from emanations from the cargo may be avoided if the external atmosphere be dry, yet if it be saturated with moisture, as is the case during heavy fogs, mists, or rain, continuous admission or circulation of moist air through the hold may increase instead of abate the injury. The different methods of ventilation, and the special cases requiring attention to it, may be found noticed under the articles coal, grain, fermentation, fruit, spontaneous combustion, sugar, and vapour damage. If a cargo should be damaged through want of ventilation, the master could be sued for such damage, and he would have to prove that the want of ventilation could not be avoided—through the perils of the sea, &c.

1313. Since the introduction of the plan of erecting cabins above instead of below, the main deck, it has been found that cargoes have been more liable to damage from moisture than they were previously. This has arisen from the stoppage of the ventilation which was before unintentionally promoted by the fire in the cabins, and by the free passing to and fro of the inmates. By judicious management this might possibly be remedied, as stated in vapour damage, by a ventilation shaft placed around the chimney of the

caboose and of the cabin stoves, but any such contrivance should have the best attention to prevent possibility of accident from smoke conveying sparks having access to the hold. Her Majesty's Emigration Commissioners recommend the plan of Dr. EDMUNDS, and require all ships chartered by them to have three spare wind cowls, with the necessary piping and materials for fixing them. A stove in the forecabin is not only advantageous to the crew, but preserves the ship from rot.

1314. MESSRS. SILVER and MOORE have patented a new method for ventilating the 'tween decks of ships. Having made sundry experiments they discovered that all gases descend; to carry them upwards, therefore, a downward and upward draught was necessary. This they have managed by opening trap valves in all the decks below the spar deck. These apertures are protected by the insertion of a round iron grating. The valves under the decks spread the air or gases and help in the down draught, and they are made self-acting, so as to close in the event of water filling the compartments of the hold, and thus stop its passage above the lower deck. To carry off the gases and all foul air from the hold, pipes are let down through all the decks to within a few feet below the lower deck. The upper parts of these pipes are conically shaped, to create a current of air. The gases are carried up, naturally, by this updraught, and pass away above the bulwarks. By this simple contrivance the patentees maintain that they can keep the 'tween decks free from impure air and foul smells, for as the pure air passes down the hatchways it carries with it the gases to the hold, and thence by the up-pipes to the spar deck. The smell from bilge-water and offensive cargoes would be considerably lessened by this mode of ventilation. The principle is said to be adopted in France, in theatres and hospitals. Some masters who have had their ships burnt at sea, attribute their loss to having insufficient control over the ventilators when numerous; their statement is that the ship has been lost through over ventilation.

1315. VERMICELLI. E.I.Co's. ton 16 cwt.

1316. VERMILION is a red colour formed of mercury and sulphur melted together and heated to redness. E.I.Co's. ton 20 cwt.; a bag 50 lbs. A Chinese box 50 catties; a Chinese box containing 90 papers, measures one cubic foot; 50 go to a ton of 50 cubic feet. In June, 1864, a quantity of assafoetida was sent on board a "general ship" loading at Bombay, which, but for the accidental bursting of one of the packages on the deck, might have led

to serious depreciation of the coffee and other edibles in the hold, by the time they were delivered in England. The cases, 150, were entered in the manifest and bills of lading as vermilion; they contained each about two maunds of hingda or hilda, the lowest class of assafoetida; it was packed in zinc soldered, enclosed in wood and covered with gunny cloth; but for the accident, there was nothing in the appearance of the cases to excite suspicion or to cause enquiry.

1317. VERMIN. The liability of owners for damage to cargo by vermin has been the subject of frequent litigation; some charter-parties include the words "damage by vermin excepted." When damage does occur, masters are always careful to "protest" against vermin, as early as possibly after arrival.

1318. Of all vermin infesting ships, the most injurious is the rat, which arises from his great instinct, boldness, and natural qualifications. The inner portion of the four front teeth of rats is soft; the outer is composed of the strongest enamel; the continual growth of these teeth can only be checked by constant use. When one has been lost, the opposite tooth has been known to lengthen until it met the gum, which caused it to turn and ultimately to pass through the lip. It is this extraordinary growing property of the front teeth which, coupled with an unconquerable thirst, makes rats so formidable. They "eat" up under the waterways of the deck until within a wafer thickness of the surface, through which dew or rain can be sucked; and where there is leakage around the partners of a mast, they eat from below up to the deck, and also up through the covering boards alongside a stanchion or timber-head; unless protected by copper, they will cut their way to the scupper-holes, when they hear water running through them. They have been known to eat through the wooden filling piece in the space where a deck-light had been originally; as the hole was fully two inches diameter, and only about 15 inches from the waterway, and nearly abreast of the pumps, it may be imagined what a quantity of water must have found its way below into the 'tween decks, on the cargo, either when the ship's pumps were used, her decks washed, or she was in heavy weather with a body of water in the lee (starboard) waist. The hole being immediately under a water cask lashed to the spare spars in the side of the ship, was not discovered for some time and the ship was believed to be making water very badly on the port tack. Grain-laden ships have been put in great danger by holes through the pump-casing, which admit cargo and choke the pumps. The greatest peril, however, is when rats attack the sides between wind and water, in the vain effort to assuage their thirst.

Guided by the rippling of the sea, they select a plank where the sap is gone close to a seam, and by combining together, work incessantly until salt-water oozes through and they find their labour useless. The weak barrier left gives way sooner or later, the cargo is injured, and the lives of all on board are in jeopardy, especially if the holes are under the channels, in the counter, or in any other concealed part. Rats will boldly come on deck in rainy weather, even in the day time, and in sight of the seamen, and will ascend the shrouds to suck water from the interstices of the rigging. Where they are so numerous, it seems better to give them a daily supply of water rather than risk such perils. Rats will gnaw holes in casks containing water, by cunningly selecting a seam close to the chime, where the heads are thinnest, and waste the ship's stores long before the voyage is completed. Casks of wine, spirits, and most other liquids, lead pipes, &c., are liable to the same attacks.

1319. At Calcutta there is a small earth rat with round ears, white belly, and yellow back ; not so anxious for water as the common rat, which they will soon drive out of the ship. These earth rats come down the country (dobah) boats, and make great havoc among hides, selecting the thick parts of the neck and rump. Bandicote rats are very large and nearly all black.

1320. When ships are loading sugar at Port Louis, Mauritius, rats at sunset, swim off from the shore in swarms, and crawl up the cables ; they feast all night and leave early in the morning. The ordinary prevention is a circular piece of wood, like the head of a cask, made in two parts, to fit on the cable at right angles ; the outside covered with tin. There is at Mauritius also a species of rat, not much larger than a mouse, which will bore holes in those parts under the ship's counters, where there is little access for air, commonly in lockers—such ill ventilated parts rotting soonest. Masters are not allowed to smoke ships here without first giving notice to the harbour-master.

1321. When **Musk rats** pass over wines in bottle, the foetid odour which emanates from them destroys the quality of the wine, unless the bottles are covered with tinfoil or metallic capsules ; sealing wax is no protection. When several travel together, they go in a file each holding in his mouth the tail of the one preceding ; this habit has induced the erroneous belief that the species is blind ; their eyes are exceedingly small, and can only be discovered by very close inspection. Cats will not touch musk rats, and very few dogs will muzzle them.

1322. Rats make considerable havoc amongst sails, especially in

those parts on which oil or grease has been dropped, and give a decided preference for new canvas, on account of the starch or sizing, or because it is softer for their nests, which are found in the bunts of the topsails, and in the jibs when stowed on the bowsprit; sails should, therefore, be loosed occasionally for this if for no other purpose. Some masters have, it is said, saved their sails by supplying soft paper for the nests. Spare sails require to be rolled up as snugly as possible; sometimes they are stowed on a number of empty water casks, and instances have occurred where the loose end has fallen down between two, and rats have eaten holes merely to obtain a clear run through. In the hold rats' nests are made in the driest parts, between the frames, on the chocks, and on the knees. It has been suggested as possible that the fibrous matter and oily substances collected occasionally for these nests may lead to spontaneous combustion. When two different kinds are on board a ship, one will locate forward, the other aft.

1323. It is very difficult to stow aniseed so as to be secured from the attack of rats; the amount of destruction which they create in a cargo of sugar is almost incredible; they will nibble away cork bungs in casks of wine, &c., and waste the contents. They are very fond of parchment, but will not touch leather bags of a tan colour. Unless driven by extreme necessity they decline beans or peas, which are difficult to masticate; neither will they eat oats or barley while wheat is to be had; and they will leave bad for good—sparing neither time, trouble, nor perseverance, to get at the best. When winches of yarn are stowed in the same hold with wheat in bulk, and the grain gets mixed with the yarn, rats, in order to get at the wheat, will eat through the yarn and much diminish its value. The loss by **Mice** in a cargo of rice is not so much from what they consume as by what they waste, and what is lost when handling bags perforated by them.

1324. **Cockroaches** will attack the corks of bottles containing champagne and other delicate articles, unless protected with tinfoil or metallic capsules. Cockroaches, scorpions, &c., come on board in firewood, bags of rice, gunny bags, &c.; in warm climates when it rains, they fly about and drop on the crew; they devour almost everything, and scarcely any poison seems to affect them; mercurial ointment, tobacco, cantharides, &c., are said to be eaten by them with avidity. When the crew are asleep in their hammocks, cockroaches will attack the hard skin on the soles of their feet until blood is drawn; toe nails, finger nails, and horn buttons are consumed in the same way. Their increase on board Calcutta and other ships,

is enormous ; when inner planks have been taken out, the space between the limbers, above the wash of the bilge-water, has been found completely full of a compact mass of cockroach dirt ; it does not appear to injure teak. When rounding the Cape of Good Hope these insects become torpid, and hang about the hold, and can be easily swept into a bucket. Although a ship may pass an entire winter in England, and all the living cockroaches may die, yet their eggs, if deposited in a warm place, will be hatched on approaching the equator ; two winters at home are said to be requisite. Cockroaches abound as much in iron as in wooden ships. Ants feed on their bodies, and are reported to attack them when alive. Spiders will attack cockroaches and bugs.

1325. **Ants.** There is a species of ant infesting the West coast of Africa, which perforates casks of oil, &c., and creates considerable loss. This ant thrives in timber ; and where the hulls of condemned slave vessels have been used for building purposes in St. Helena, their ravages have so weakened the sills of the windows, the frames of doors, &c., as to involve the necessity of taking down houses to prevent them from falling. In the Mauritius there are white ants which perforate casks of port wine ; every year they are furnished, for a short time, with wings, which fall off as they fly ; where the insects drop, the work of destruction commences. About the year 1828, the son of Judge SMITH, while writing, was suddenly killed by a roof beam, the end of which had been gradually destroyed by these insects. Red ants are said to infest teak timber ; ants cannot readily cross powdered chalk.

1326. In passing the accounts for troop ships, at the *Admiralty*, a quantity of provisions, equal to one-tenth part of the established proportion for the number of persons actually victualled, is allowed for waste and for destruction by vermin.

1327. **Smoking Ships.** The course usually adopted for the total destruction of vermin, is to stop every crevice, and smoke the ship with a fire of charcoal in the hold, or with sulphur, or mercury, &c. Charcoal fires should be made near the deck, not low down on the keelson. A practical chemist recommends chlorine instead of vapour or sulphur ; the gas from chlorine is violently irritating, and its inhalation may cause serious illness if not fatal results. Some recommend the suspension of iron pots containing quicksilver, about six or eight inches above the fires, which is said will destroy beetles, cockroaches, bugs, &c. ; when quicksilver is used the residue will not be injured, nor will much have evaporated. After the mercury is put over the fires, it is dangerous for anyone to remain in the hold.

Some run the mercury into deep gimblet holes bored in thick pieces of wood, which they calculate will not be burnt through until the last hatch is down. Ships are generally smoked in dock, when the cargo is out, but if rats are found to be increasing at sea, the process can be performed in warm latitudes, where all hands can sleep on deck under awnings: for this reason every ship destined for a long voyage, should take a supply of charcoal, &c. In all cases especial care should be observed not to allow anyone to go below during the fumigation, or even to sleep in a round-house on deck, until several hours after the hold has been well ventilated. Fumigations at sea are, however, dangerous, and should if possible be avoided, as some ships have been thereby burnt, and many lives lost. After smoking, rats are usually found near the fire, but some are in other parts, especially where it is likely there may be small openings—usually in the ends. Some owners contend that the best and least dangerous way to destroy vermin is to clear out everything during a very hard frost, open all the hatchways and entrances, remove the vent-boards in the hold, the limber boards, &c., &c. It is contended that by this mode, rats, mice, cockroaches, and every description of vermin have been destroyed.

1328. Food flavoured with oil of carraway, mixed with nux vomica, will poison rats and mice; with strychnine their bodies will be found near. Phosphorus mixed with fat, heated to 150°, will have the same effect, especially if a good supply of water is close at hand; they should be fed some days previously with scraps of bread and cheese, and clean water. The use of poison, however, is very dangerous, as its destructive properties may be communicated to food intended for human consumption. It is said that rats will not remain in a ship containing assafoetida, and that if entirely deprived of water when close to the shore, they will leave. Every possible means should be adopted to prevent their approach, which usually takes place by night. Planks communicating with the shore or with other ships should, where practicable, be removed early, and bundles of furze or birch should be fastened around cables and warps when lying in a tidal harbour.

1329. When numerous, rats will attack the common English domestic cat, and if unsuccessful in destroying it, will much diminish its usefulness. At Milford, in 1857, a cat was taken on board the guano-laden Dutch ship *Konign der Nederlanden*, in the evening; the next morning nothing was to be seen but her skin and bones. The ring-tailed Malay cats, being very strong, can more easily secure rats, with which they feed their young. Bull-terriers are considered

preferable to domestic cats, but they cannot follow vermin so easily ; to be of service they should weigh 8 to 14 lbs., over that they are unwieldy. A wire trap with a wire bottom, placed on a bucket of water, has often proved successful. Rats will not eat food that has been handled, and will carefully avoid a trap that has been chafed by their own species.

1330. ABBOT, in his work on shipping, says : moreover, the master must, during the voyage, take all possible care of the cargo. If it require to be aired or ventilated, as fruit and some other things do, he must adopt the usual and proper methods ; and although he is not responsible for injury done to it in consequence of a leak occasioned by tempest or other accident, yet, where rats occasioned a leak, whereby the goods were spoiled, the master was held responsible, notwithstanding the crew afterwards, by pumping, &c., did all they could to preserve the cargo from injury ; and this determination agrees with the rule laid down by Roccus, who says : if mice eat the cargo, and thereby occasion no small injury to the merchant, the master must make good the loss, because he is guilty of a fault. Yet if he had cats on board his ship, he shall be excused. This rule, and the exception to it, although bearing somewhat of a ludicrous air, furnish a good illustration of the general principle, by which the master and owners are held responsible for every injury that might have been prevented by human foresight or care. In conformity to which principle they are responsible for goods stolen or embezzled by the crew or other persons, or lost or injured in consequence of the ship sailing in fair weather against a rock or shallow known to expert mariners.

1331. It has been held that if a master can produce evidence to show that he has used every precaution to guard against rats, before taking in the cargo ; that the ship was seaworthy, as far as rats were concerned, when taken in ; and that after taking it in, and during the voyage, he took every means in his power to protect his cargo, and to keep clear of rats ; the consignee could not recover compensation. Referring to damage caused by this class of vermin, it has also been held that where rats occasion a leak in a vessel, whereby the goods are spoiled, the owners are responsible, as they would also be if a cargo were eaten by mice, unless the master can show that proper precautions were taken and that he had sufficient cats, in which case the ship would not be liable.

1332. **Cheese.** In the Court of Exchequer, Baron MARTIN decided that where tubs containing Parmesan cheese, shipped at Genoa for London, had been broken in stowing, and their contents destroyed by rats, the ship was held liable, notwithstanding there were cats on board.

1333. *Coffee*. In the United States District Court, December, 1861, Judge SHIPMAN gave judgment in the case of WM. P. KIRKLAND *v.* the barque *Fame*, as follows:—This libel seeks to recover damages for injuries to coffee transported from Rio Janeiro to New York. The answer alleges that this occurred, not from any cause for which the barque or her owners are responsible, but solely from "the dangers and accidents of the sea and navigation." It is clear that a portion of the injury was caused by rats. This fact was anticipated by the answer, which alleges that due care was exercised, two cats being kept on board from the time the coffee was laden. Claimants insist that, having exercised due care, the injury is within the exception of the bill of lading, and is to be deemed one of the "dangers or accidents of the sea and navigation." On the other hand, the libellants maintain as matter of law, that damage to a cargo by being gnawed by rats, is not a peril of the sea within the meaning of that term or the terms used in the bill of lading; and that, therefore, the claimants cannot exempt themselves from liability by showing that they adopted certain precautions. The question of damage done by rats has been the subject of repeated decisions by courts, and has often been discussed. The oldest case which has generally been relied on at all is that of "*DALE v. HALL*," (WILSON, R. p. 281) an action in the King's Bench, on a contract to carry. Mr. Justice BURNETT admitted evidence to show that rats had gnawed a hole through the bottom of the ship, by which the damage occurred. A verdict was given for defendant, and on motion for a new trial the verdict was set aside (LEE, ch. 1), remarking that the ruling below was clearly wrong. In this the whole court concurred. By the report it appears that the judge who tried the case was in doubt as to the admissibility of the evidence. This case was decided in 1750. In the case of "*HUNTER v. POTTS*," (4, CAMPBELL, 203) in 1850, Lord ELLENBOROUGH held, in a *Nisi Prius* trial, that a loss arising from rats eating holes in the ship's bottom was not within the perils insured against in the common form of a policy of insurance. Of course he held it not a peril of the seas. But a very recent English case, "*LAVERONI v. DRURY*," (16, Eng. Law and Eq. Rep. 510), fully sustains the claim of the libellants in this case. It was there held that a cargo of cheese having been damaged by rats the injury could not be attributed to a peril of the sea, that it was a "kind of destruction not peculiar to the sea or navigation, or arising directly from it, but one to which such a commodity as cheese is equally liable in a warehouse as in a ship at sea." The court held that the presence of cats as is alleged in the present answer, was no defence. It is true that Judge STORY states that the Continental writers on maritime law maintain a different doctrine, although he says the English law holds the ship liable. But I do not understand him as endorsing the doctrine of the foreign writers, although he does not expressly dissent. Here are two cases which conflict with the English rule—"CARRIGUES *v.* COXE," 1 BINNEY, 592, and "AYMER *v.* ASTOR," 6 COWEN, 266. Of the former, ANGELL in his work on the "Law of carriers," remarks, "But this has been considered and pronounced to be the only case contrary to English law." As to the case of "AYMER *v.* ASTOR," the reasoning of the Court on this point does not appear to be wholly consistent with either doctrine, and consequently is sometimes cited as supporting the English rule, and sometimes as in conflict with it. The learned libellant, in the case under consideration, has cited it in support of his claim, but I agree with the claimant's counsel that it has no such effect. On the trial in the court below, the judge charged the jury that damage by rats was not a peril by sea, and therefore not within that exception in the bill of lading. To

this part of the charge exception was taken, and on the hearing of the writ of error, judgment was reversed. SAVAGE, Chief Justice, said, in giving the opinion of the court—and in this part of his opinion the whole court concurred—"The true question to be submitted to the jury was, whether the master had used ordinary care and diligence; whether a cat is a sufficient preventive; or whether smoking the ship is the proper or more efficacious remedy, is a proper consideration for the jury." This view of the court must have proceeded upon the idea that damage by rats was a peril of the sea, against which the masters and owners were not obliged to secure the cargo at all hazards, and, therefore, came within the exceptions in the bill of lading. This, of course, would let in the proof, and if the fact that ordinary care and diligence were used, was proved, it would excuse the ship. Of course, too, without this care and diligence, the extremest perils of the sea would not excuse a loss. If a ship were destroyed by a tornado, unless ordinary diligence to prevent it were shown, the loss would not be a peril of the sea within the meaning of the law. The result to which the court came in this case of "*AYMER v. ASTOR*," was a logical deduction from the principle which they assumed—that the master of a ship was "not responsible like a common carrier for all losses, except they happen by the act of GOD or the enemies of the country." I understand that this principle has been distinctly overruled. ("*SEWELL v. ALLEN*," 2 WENDELL, 327; ANGELL on Law of Carriers, sec. 80 and sec. 170, note GREENLEAF; overruled cases, revised edition, 1856, page 23). After careful examination of the authorities, I am inclined to adopt the conclusion of Chancellor KENT, who, after remarking that it was a "vexed question, upon which the authorities are much divided," says—"the better opinion would, however, seem to be, that the insurer is not liable for this sort of damage, because it arises from the negligence of the common carrier, and it may be prevented with due care, and is within the control of human prudence and sagacity." (3 KANT'S Com. 300, 301). This conclusion has since been strengthened by the case "*LAVERONI v. DRURY*," already cited. But whatever may be the conclusion warranted by the authorities, I do not think the master of the *Fame* has proven due diligence on his part. The witnesses offered by the claimants, consisting of several masters who carry similar cargoes from Rio, say it is a very bad port for rats. The master of the *Fame* himself testifies that it is the worst port for rats he ever visited, and he always has some on board. Yet he did not fumigate his ship. Knowing the danger, as he admits he did, I think common prudence would have led to the use of every known means of ridding her of the vermin. Let a decree be entered for the libellants, with an order of reference, and let the Commissioner in his report carefully distinguish the various kinds of damage to the cargo, and the causes of that damage.

1334. *Coffee*. Common Pleas, 24th January, 1866, *KAY v. WHEELER*. A special case stated without pleadings for the opinion of the Court. Defendant's ship *Victoria* took on board from Messrs. WILSON and Co., at Ceylon, a parcel of coffee, consigned to plaintiff. The bill of lading was in the ordinary form, the goods were, therefore, to be carried safely and securely, the perils of the sea, the Act of GOD, and the Queen's enemies, only excepted. On arrival, it was found that rats had gnawed the bags and caused a loss of £25. Defendant denied liability because it was not through his fault; the ship was cleared before starting, and two cats and two Cingalese ferrets were placed on board. Sir G. HONEYMAN said that it was preposterous for defendant to say he was not liable because he had cleared the ship, for the loss did not arise from any of the excepted perils.

He did not know whether it was meant to be contended that the loss was caused by the "perils of the sea." Mr. Justice WILLES : He would probably say that the damage arose from the perils of navigation. Sir G. HONEYMAN : The Court of Exchequer had delivered an elaborate judgment, "*LAVERONI v. DRURY*," to the effect that an owner was not excused from damage by rats, notwithstanding he kept cats on board. Mr. W. WILLIAMS, for defendant, tried to distinguish this case from "*LAVERONI v. DRURY*." Mr. Justice SMITH said the only difference seemed to be, that here there were two ferrets in addition to two cats. Mr. Justice WILLES thought that it was a barbarism that a carrier should be more liable than any other bailee, but such was the law. The Court held that they were bound by the decision in "*LAVERONI v. DRURY*," which, if questioned, must be so in the Court of Error. Judgment for plaintiff, which was confirmed on an appeal to the Exchequer, 4th February, 1867.

1335. VINEGAR ; specific gravity 1·013 to 1·080 ; see casks, general cargo, and liquids. An Admiralty puncheon contains 72 gallons ; hogshead, 54 ; barrel, 36 ; half-hogshead, 25 ; kilderkin, 18 ; small casks, 12 gallons.

1336. VITRIOL, Oil of (sulphuric acid), should be stowed on deck, at shipper's risk, to be thrown overboard in case of necessity ; if in the hold and fire occurs, the owner may be liable for the entire loss ; if absolutely necessary, package in sand will lessen the danger. The Liverpool underwriters recommend vitriol to be stowed on deck, and packed in small iron tanks or very strong wooden casks weighing not more than two cwt., so as to be easily handled on emergency. In coasting vessels it is encased in strong basket work and stowed on a ballast of coal having a perfectly flat surface.

Tonnage. 100 carboys oil vitriol, 8 tons, will occupy a space of 850 cubic feet or 1 keel. When wheat is 1s. $\frac{1}{2}$ quarter freight, vitriol is rated at 7 $\frac{1}{2}$ d. $\frac{1}{2}$ carboy. Carboys range from 1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ cwt. gross, generally 1 $\frac{1}{2}$ to 1 $\frac{3}{4}$, averaging 1 cwt. 2 qrs. 14 lbs.

1337. WAGES. The master of the *Syria*, from Barbadoes, delivered to his mate an account of wages due, £48 10s. 7d., and afterwards discovered that he had to pay £38 10s. for two hogsheads, 17 only being in the hold, and the mate having signed for 19. Mr. PAGET, at the Thames Court, said 15th August, 1859, that he could not repeal an Act of Parliament. The master was bound by the account he had delivered.

1338. **Wages.** SECTION 19 of the Merchant Shipping Amendment Act, 1862, says : The payment of seamen's wages required by the 209th section of the principal act shall, whenever it is practicable so to do, be made in money and not by bill ; and in cases where payment is made by bill drawn by the master, the owner of the ship shall be liable to pay the amount for which the same is drawn to the

holder or endorsee thereof; and it shall not be necessary in any proceeding against the owner upon such bill to prove that the master has authority to draw the same; and any bill purporting to be drawn in pursuance of the said section, and to be indorsed as therein required, if produced out of the custody of the Board of Trade or of the Registrar-General of Seamen, or of any superintendent of any Mercantile Marine Office, shall be received in evidence; and any endorsement on any such bill purporting to be made in pursuance of the said section, and to be signed by one of the functionaries therein mentioned, shall also be received in evidence, and shall be deemed to be *prima facie* evidence of the facts stated in such indorsement.

SECTION 20th says: The 197th section of the principal act shall extend to seamen or apprentices who within the six months immediately preceding their death, have belonged to a British ship; and such section shall be construed as if there were inserted in the first lines thereof after the words "such seaman or apprentice as last aforesaid" the words "or if any seaman or any apprentice who has within the six months immediately preceding his death belonged to a British ship."

[At the close of the article mate, there are the details of several cases of disputed wages which were settled in Courts of Law.]

1339. A master writes to the *Shipping Gazette*, 5th September, 1866:—"My vessel on her passage to Alexandria, founders. The crew, four days after, land at Tripoli, and are subjected to a ten days' quarantine. The master, being so advised by the consul, pays the crew up to the day when quarantine closes. The owner states that the wages ceased from the time she went down, and refuses to repay the account. Has the master a claim on them?" Answer: "The wages are only due up to the time the vessel was lost."

[In the Board of Trade Instructions to shipping masters it is said: "In all cases where the word 'Month' only is used, the calendar month is implied, whether of 28, 29, 30, or 31 days, as the case may be. The day upon which the wages are to commence, as specified in the agreement, and also the day of discharge, must be included in computing seamen's wages." This does not however preclude seamen from making special arrangements.]

1340. *Mate*. At the Mansion House, London, 20th May, 1866, before Mr. Alderman LUSK, JAMES DALLEY, mate of the *Sir Ralph Abercrombie*, abandoned off the Cape of Good Hope in the winter of 1864, sued her owner, Mr. JOHN BRODIE, of 21, Mark Lane, for £28 15s. wages, for which payment was refused, on the ground that the abandonment was reckless. The vessel had lost her rudder and bowsprit; she did not make much water, and the crew were only four hours at

the pumps. The master, his wife, and all the crew took to the lifeboat and went on board a passing ship, the *Martaban*, the crew of which the next day boarded the *Abercrombie* and took her into Table Bay. The master's certificate was in consequence suspended by the Marine Board for two years and the mate's for six months. Mr. BRODIE had to pay heavy salvage to the salvors. An apprentice stated that if the crew had stood by the ship and the officers had acted properly, she would have been saved, but the Alderman decided that the crew were bound to obey the master, and decided that the demand for £28 15s. must be paid with costs. [This decision of the magistrate in favour of the second mate was questioned by those who consider that when a portion of the *Sir Ralph Abercrombie's* crew went on board, the second mate might have joined them.]

1341. A rather novel case was heard before the Newport magistrates, in October, 1866. Capt. JAMES ALDRIDGE, of the *Clara*, of Southampton, was summoned by HENRY CARROLL, one of his crew, to recover £3 wages due. The master said he was willing to pay £2 9s. 1½d., and stated the facts, which CARROLL said were correct. The articles specified that the crew were to discharge the cargo and ballast, and to place the vessel in a loading berth. An anchor had been found and brought to the vessel, and it was lifted up by crane as high as the bulwarks. CARROLL and the rest of the crew were ordered to assist in guiding it on board, but they refused, and the master refused to allow them to discharge the cargo (iron), but employed other men to do it, deducting the expenses out of what was coming to complainant and the rest of the crew. CARROLL said he was willing to discharge the cargo, but the master would not permit him. The Bench held that as complainant had refused to obey the orders of the master, he was perfectly justified in the course he had adopted, and made an order for £2 9s. 1½d., the complainant to pay all expenses.

1342. WALNUTS. A bag weighs about one cwt., but the weight varies according to the port of lading : see fruit.

1343. WHANGHEE, Whangee, from the Chinese *Whang*, yellow and *hee* root, the name of some canes imported from the East as walking sticks, and said to be the root of the narrow-leaved bamboo ; they are valuable on account of the sufficiently straight root being difficult to procure. The Whanghee has a pale hard bark and flexible stem, with internodes of about an inch and a half or two inches, and a number of little holes at the knots. It is sometimes called Japan cane. The inferior sort is dark coloured, badly glazed, and light. At Bombay 6,000 (16 cwt.) to a ton for freight.

1344. WAR CHARTER-PARTY; *Esposito v. Bowden*. This was a writ of error from the Queen's Bench, and was argued Michaelmas, 1856. An action on a charter-party brought against a British merchant who had chartered the vessel (a neutral) before the declaration of the war with Russia, to go to a Russian port, and there put on board a cargo to be conveyed to this country. The question was, whether the breaking out of the war before the arrival of the vessel at Odessa, operated as a nullification of the charter. Defendant

pleaded that it excused him from the performance of his contract, as it was impossible to carry it into effect without violating the law by trading with the Queen's enemies. The Court of Queen's Bench held this plea was no answer to the action. The important question was, whether the plea was a good one. It was clearly established that the effect of a declaration of war was to put an end to all intercourse with an enemy's country, and to make it illegal. In 1799 some doubt was thrown upon the principle, but in 1800 Lord KENYON decided that a declaration of war was an absolute interdiction of commercial intercourse between two hostile countries—it had all the force of an Act of Parliament. It was an exercise of the prerogative of the Crown, and every authority, particularly Lord MANSFIELD, Sir C. ROBINSON, and Justice STOREY, laid down that it had all the force of law, and was, in fact, a portion of the law of England. Then they had to enquire what was the effect of a declaration of war upon a contract made before, and remaining unexecuted at the time of such declaration. It had been held by Lord ELLENBOROUGH, and laid down by Chancellor KEAT, that the effect of a declaration of war upon such a contract, was to dissolve the contract and excuse the parties from performing it. If a British subject not domiciled in an enemy's country, shipped a cargo in a neutral vessel from an enemy's port, he would be trading with the enemy and violating the law, and neither the English subject nor an alien friend, could bring an action against a person for refusing to perform a contract containing an undertaking to do so after war had been declared. On these grounds, the Court were of opinion that the judgment of the Court of Queen's Bench ought to be reversed, and judgment entered for the defendant. Judgment for defendant accordingly.

1345. WASTAGE. When goods are conveyed from one place to another by different vehicles or ships, the last one is considered answerable for wastage or pilfering. It is therefore sometimes necessary, when conveying valuable liquids, to take what is termed the dry inches of each cask on receipt, as a guide for the settlement of any demand on delivery. It would prevent much annoyance to shipowners and consignees, if permission could be granted by the Customs and Excise, to allow officers, when required, to witness the dipping of wine and spirit in bond, when being conveyed from one port to another : see deficiency, beer, spirits, &c.

1346. WATCH TACKLE. A small tackle with a double and single block, usually called by seamen, "Handy Billy." Some masters consider that when cargo is breaking out in the hold, a

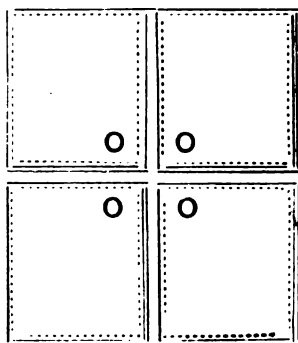
watch tackle is worth four men pulling or heaving on deck, and that the frequent and judicious application of it often prevents heavy claims on the ship for breakage.

1347. WATER. Masters should, if possible, have the purity of the ship's water guaranteed, or else send a trustworthy person to control the source of the supply. Ships occasionally obtain unwholesome water at Calcutta, where, unless well watched, the owners of the supply boats will pull out the plugs and deliver river water for the use of the men; the Hoogley is well known to be the receptacle of the dead all along its banks, and the crews of ships are often afflicted on the passage home, especially in the colder latitudes, with disease clearly traceable to the consumption of unwholesome water. According to the Passenger Act, 1855, each statute passenger and seaman is entitled to three quarts daily, in addition to at least ten gallons daily for cooking, for every hundred statute adults on board. When casks are used, they must be sweet and tight, of sufficient strength, and wood properly charred inside, and capable severally of containing not more than 300 gallons each; the staves of the water casks are not to be made of fir, pine, or soft wood. By an order in Council, 6th May, 1857, any "passenger ship" with steam power sufficient to propel her, without the aid of sails, at the rate of five miles per hour, may proceed with only half the quantity of water required by the above Act, provided, 1st—that she has an efficient *apparatus* for *distilling* fresh-water from salt-water; 2nd—that the owner, &c., lodges a certificate, declaring the apparatus to be in good condition, and the number of gallons which can be distilled in 24 hours; 3rd—that the Emigration Officer is satisfied therewith; and 4th—that there is on board a person competent to manage the apparatus. The calculation for the daily issue of water is usually as follows: crew 6 pints in cold weather, 7 pints in hot weather; passengers and servants, one gallon each, to include washing and cooking; horse, 6 gallons; cow, 8 gallons; sheep, $1\frac{1}{2}$ pints; pig, 2 quarts; 1 dozen fowls, $1\frac{1}{2}$ pints; geese, 1 gallon; ducks, 1 quart.

1348. An experienced master says: when a large quantity of water has to be carried, the best plan is to have a couple of longers of tanks (400 gallons), or casks, at the fore and after hatchways, and to rise them from the skin and carry them from wing to wing; stowing with them wet provisions (salt beef, pork, &c.), you then may not only trim the ship, but admit the leakage to pass through without damaging cargo, and the water being towards the ends is better for lightening than in amidships. Beer, in wood, for troops, is also stowed with the water, or in the same place, for the above

reasons, but generally at the after hatch. Capt. PARISH, E.I. Co., recommends that each cask should be well bunged up when emptied, which will not only prevent dirt from getting in, but, in case of any serious accident—such as collision, or striking on a rock—might be the means of keeping the ship afloat for days. Some masters recommend that water for ship's use should never be put below the main deck, as cargo is liable to be injured when taking out water stowed near.

1349. Iron tanks for containing water, are usually made to fit the run or any other part of the vessel. A naval officer recommends it as a good plan 'to stow tanks by fours, with the lids together, so



that in clearing away to get at one tank, you clear away four'—see engraving. Fixed tanks, containing enough for the use of the crew, are now generally placed on the keelson, near the pump-well or chain locker; those required for passengers are mostly 4 feet cube, hold 400 gallons, are moveable, and are frequently sold in the colonies, when not required for the voyage home; but if required, are often filled with merchandise, oils, &c., and are also used to contain biscuit. Tank weighs $1\frac{1}{2}$ to 2 lbs.

per gallon, according to their shape, and occupy, *pro rata*, about half the space of casks. When the interior corrodes, the water, by the motion of the ship, becomes discoloured, and is then termed "ship's port wine" by the seamen. In this condition it is not considered injurious, and can be completely filtered. Water which appears quite putrid when first the bung is taken out of a cask, becomes sweetened by exposure to the air, in a few days or even hours. A pound of charcoal thrown into a cask of water, twelve hours before use, will purify it. Gutta percha piping is the cleanest and best material to be used when water is pumped from the tanks to the decks. When tanks are fitted close, the timber underneath rots, especially after it becomes rusty. Leakage is often caused by keeping the hose on after the tank is filled. A Boston shipowner boxes off those parts which come between the tanks and the ship, and at stated periods inserts salt, which preserves the wood from rotting. If large tanks are placed in the centre of the ship, so as to bear on a limited surface, their weight may open the garboard streaks, especially if the wood has been previously weakened by leakage of fresh-water. All

water tanks should be well scraped and washed, and then white-washed before refilling. When stowing cargo against the water tanks, it is necessary to prevent injurious pressure; see wool.

1350. Mr. BRADY, U.S. Navy, says: previous to getting on board the tanks, a plan of stowing them may be easily arranged by means of rough models in wood, which a carpenter can readily make. In getting the tanks from the store, attention should be directed to the lid sockets, which if not properly lined with fearnought will allow much of their contents to escape in rolling; as also to the obtaining the proper number of keys, and see that they are short enough to work between the decks and the tanks, if the vessel is a small one. The screws for letting off the water require careful treatment, for they are apt if once started, never to be so tight again; and after being three or four years in use, the nuts decay, rendering the keys useless. Whitewashing tanks inside, is found, by experience, to be highly useful in keeping water pure.

1351. 210 gallons of water are computed to a ton; the London Water Company computes 6 barrels of 36 gallons each (216 gallons) to a ton. 224 gallons weigh 20 cwt., reckoning a gallon to weigh 10 lbs.; a gallon contains 277·274 cubic inches; a cubic foot 6½ gallons. Nine cubic inches become ten by freezing; and a cubic inch, confined and frozen, expands with a force equal to nearly 13 tons—a fact which, if not considered in the arrangement and management of these pipes and valves, which, in ships communicate with the sea, may lead to dangerous accidents. The specific gravity of distilled water is 1·000, of sea-water 1·028, seltzer 1·003. 35 cubic feet of sea-water weigh 20 cwt. At Madras a boat load of water is 4 butts—the price 55 fanams 40 cash = 4¾ rupees nearly.

WEIGHT OF WATER AT ITS COMMON TEMPERATURE.—U.S.

1 Cubic inch	·03617 lbs.	1 Cylindrical foot ...	49·1 lbs.
12 — inches ...	·434 lbs.	1 — — — — —	4·91 gals.
1 Cylindrical inch	·0284 lbs.	2·281 feet	1 cwt.
12 — inches ...	·341 lbs.	45·62 — — — — —	1 ton.
1 Cubic foot	6·25 gals.	11·2 Imperial gallons	1 cwt.
1,792 Cubic feet	1 cwt.	22·4 — — — — —	1 ton.
35,840 — — — — —	1 ton.		

As a gallon of fresh-water weighs 10 lbs., by multiplying the contents of a cask or tank in gallons by 10, the weight in pounds avoirdupois is obtained. A cubic foot of rain-water = 1,000 ounces avoirdupois = 62½ lbs.

What is an Inch of Rain?—The Registrar-General gives the following information in respect to rainfall: “Rain fell in one week

STEVENS ON STOWAGE.

1. *Paint and Oil.*

2. *General Store*

3. *Bread*

4. *Coal locker*

5. *Tanks*

6. *Casks*

7. *Chain locker.*

8. *Tier-Gratings.*

9. *Shot locker*

10. *Shell room.*

11. *Spirit.*

12. *Bread.*

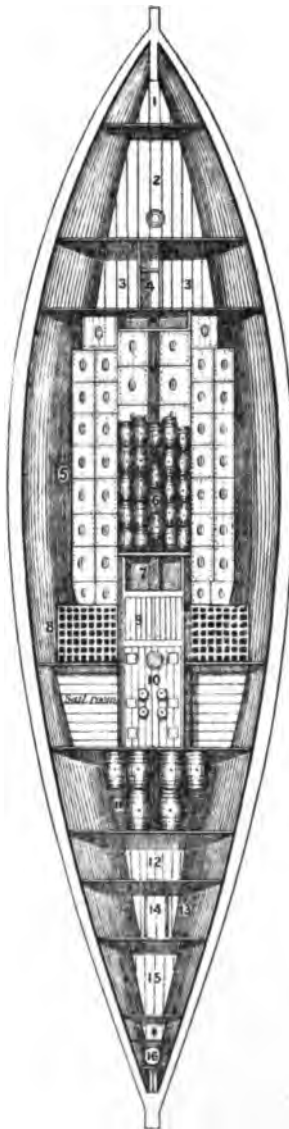
13. *Slop room.*

14. *Marine Stores.*

15. *Magazine*

* *Filling-room.*

16. *Light-room*



HOLD STOWAGE OF A SLOOP OF WAR, U. S.

As copied from BRADY'S *Kedge Anchor*, Digitized by Google

in London to the amount of 0·43 inches, which is equivalent to 43 tons of rain p acre. The rainfall during the previous week varied from 30 tons p acre in Edinburgh to 215 tons p acre in Glasgow. An English acre consists of 6,272,640 square inches; and an inch deep of rain, on an acre yields 6,272,640 cubic inches of water, which at 277·274 cubic inches to the gallon, makes 22,622·5 gallons; as a gallon of distilled water weighs 10 lbs., the rainfall on an acre is 226,225 lbs. avoirdupois; but 2,240 lbs. are a ton, and consequently an inch deep of rain weighs 100·993 tons or nearly 101 tons p acre. For every 100th of an inch, a ton of water falls p acre."

ADMIRALTY TANKS.

Description.	Capacity in Gallons.	Weight when Empty.	Cubic feet.	Description.	Capacity in Gallons.	Weight when Empty.	Cubic feet.
No.	gal.	c. qr. lbs.	feet.	No.	gal.	c. qr. lbs.	feet.
1	600	10 2 12	101	7	400	7 1 7	68
1A	300	7 0 25	51	7A	200	5 0 6	35
2	575	10 0 22	96	8	375	6 3 26	64
2A	287	6 3 15	49	8A	187	4 3 0	32
3	510	9 0 18	87	9	310	6 1 6	54
3A	255	6 2 0	44	9A	155	4 1 7	27
4	500	9 0 2	85	10	200	4 2 17	35
4A	250	6 0 15	42	10A	100	3 1 5	18
5	475	8 2 5	80	11	100	3 1 7	20
5A	237	5 3 17	41	12	300	6 0 9	51
6	410	8 0 0	68	13	200	4 3 23	34
6A	205	5 1 24	35	14	100	3 1 0	17

1352. WATERPROOF CLOTHING. The royal mail steam ship *Seine*, Capt R. REVETT, left the Island of St. Thomas, 13th August, 1865. At 9-30 p.m., when 30 miles off, smoke was observed coming up one of the pipes leading to the chain lockers. In the fore hold were 1,200 packages of indiarubber waterproof clothing, tobacco, and cases of cigars. The hatches were battened down, holes cut in the deck, and five or six hoses played on the burning cargo. She returned to the island, where, with help from the ships *Solent*, *Eider*, *Conway*, and *Derwent* the fire was extinguished. It is supposed to have originated through the spontaneous combustion of the macintosh clothing, shipped back from Havannah to Europe; the charred remnants smelt strongly of naphtha; the directors have prohibited such articles from being shipped on board their vessels.

1353. WELL, an apartment formed in the middle of a ship's hold, by bulkheads, to enclose the pumps from the bottom to the

lower or upper deck. It is used as a barrier to preserve those machines from being damaged by the friction, or compression of the materials contained in the hold; also for preventing damage to a dry cargo, by water escaping from the pumps; and particularly to prevent the entrance of ballast, &c., by which the tubes would presently be choked, and the pumps rendered incapable of service. They are also convenient for descending into the hold in order to examine the state of the pumps, &c.

**WEIGHTS.—LIST OF BRITISH IMPERIAL WEIGHTS OF
ORDINARY MERCANTILE PACKAGES.**

Arsenic, cask	cwt.	4	Hemp, bale	cwt.	2½
Ashes, American cask	—	4 to 5	Indigo, chest ...	lb.	300
Ashes, Russian	—	10	Jute	cwt.	2½
Bristles, cask	—	10	Lac, chest	lb.	200
Cinnamon, bale	lb.	100	Lead, black, cask ...	cwt.	11½
Cocoa, bag	cwt.	1½	Madder	—	15 to 20
— cask	—	1 to 4	Molasses, puncheon...	—	10 to 12
Coffee, tierce	—	5 to 7	Opium, chest	lb.	149
— bag	—	1½ to 1½	Pepper	cwt.	1
Cotton, Carolina, bale	lb.	300	Rice, bag	—	1½
— New Orleans	—	500	Sago, bag	—	1
— Egyptian ...	—	200	Saltpetre, bag	—	1½
Currants, butt	cwt.	15 to 20	Sugar, hhd. about ...	—	15
Flax, Russian	—	5 to 6	— E. India, bag .	—	1½
— Flemish	—	2	Tar	gal.	26
Galls., bag	—	3½	Tea, chest	lb.	84
Ginger, barrel	—	3½	Tobacco, hogshead...	cwt.	12 to 13
— E. India bag	—	1	Turpentine, barrel ...	—	2½
Gum Arabic, 1 chest	—	2			

1354. WEST AUSTRALIA. An experienced master says :—
The principal port is Freemantle, situated on the coast, on the south side, and at the entrance of the River Swan, the anchorage is termed Gage's Roads, but ships are anchored for safety during the winter months under lee of Garden Island, the heavy-north-west, and westerly gales, sending such a heavy sea into the roads, that, it is not safe to lie there. Bills of lading from England especially provide for discharge at Gage's Roads, Owen's Anchorage, or Cockburn Sound. Lighterage 5s. $\frac{1}{2}$ ton from the roads, and 10s. or 12s., as per agreement, but this expense is borne by consignees—the last charges from Garden Island.

1355. Lead ore, 14 bags, equal to 1 ton, of 2 cwt., is shipped by the vessels taking wool for England, at 30s. $\frac{1}{2}$ ton, an extreme rate for cargo, which is of so much importance as dead-weight, and with-

out which the ships would have to take either sand or stone ballast. Four to five ships, averaging about 500 tons register, load direct for London each season, (October to February) with wool, principally at a rate of from 1½*d.* to 1¾*d.* *per* lb., in pressed bales of irregular shape and size, which involves great labour in the stowage, consequent detention, and considerable expense. Manna gum has been largely shipped heretofore, for England in empty beer hogsheads (four to the ton), but at present there is no demand, and it comes to a bad market ; large pearl oyster shells are packed also in casks and cases for England ; they are brought from Nicol Bay (north-west coast), where a number of small vessels and boats are employed in the fishery. Champion Bay is about 230 miles north of Freemantle, from whence the bulk of the lead ore is shipped in the wool vessels, on the completion of the discharge of the outward cargo ; the copper and lead ores were carted to Champion Bay, when the Wheal Fortune, and other mines were at work, but at present the Geraldine mine on the Murchison River, is the only working mine producing large quantities of ore, which is carted to and shipped at Port Gregory, a naturally-formed harbour inside a remarkable long reef, which, attached to the main at one end, diverges at an angle, extending some three miles, with two breaks at the north-west end, forming navigable openings, makes a triangle-shaped dock-like harbour. Vessels of from 200 to 300 tons register, drawing 15 feet of water, can easily, with a leading wind, run up the harbour and load to the south-westward of the temporary and incomplete jetty now standing ; the entrance from the north-westward, clear of the extreme rock of the reef, is perfectly open and safe, and is the preferable passage for a fair-sized vessel. Inside the entrance of the port is a whaling station, with try works, winch on the beach, and several houses for accommodation for the men during the season, which extends from June until September, at which time the fish abound. Much larger quantities of oil could be obtained if all the fish that were killed could be towed into the harbour, instead of being left outside for some time, and then partially, if not entirely devoured by the multitude of sharks with which the waters are teeming.

1356. Horses, sheep, and kangaroo hounds, are shipped off to Singapore and the Indian ports, in the vessels that carry sandal wood, and in the larger ships, that find employment in the conveyance of railway sleepers (Jarrah timber). A considerable timber trade has sprung up between Swan River and South Australia, as also the Mauritius ; for the latter place, small building material is principally shipped, but for the Eastern Provinces, large heavy timber is more

frequently required. Most of the timber vessels are sent (when chartered) to Geographe Bay, where there are several anchorages, but all more or less open and exposed, and therefore, not safe. A small township named Bunbury is the principal place, from whence shipment is made of the wool of the district, about the end of the year, and a good deal of produce is forwarded thence to the Freemantle and Perth markets.

1357. A timber, called raspberry jam wood, is found in the colony, which can be worked into furniture, and takes a very handsome polish, cut into three feet logs; it has been sent in some quantities to Melbourne, where it has found more favour than in England; it recommends itself partly by the strong flavour or odour when it is cut or scraped. of the jam from whence it is named.

1358. Coal exists in the country, but, its distance from the sea-board as yet deters anyone from attempting to open out any mine or workings, and until steamers are placed on the coast to do the work in lieu of the sailing vessels, there can be no inducement. In the vicinity of the mines, where fuel is getting scarcer from the large consumption of wood for engine purposes, as well as domestic use, it will eventually become a necessity to form coal depôts, and either work the existing seams, or import from England direct, or New South Wales.

1359. In Shark's Bay, a large fish called the dugong is very plentiful, from which a good oil is procured, said to be equal to cod liver oil, each fish yielding from three to five gills; on the islands in this extensive bay, those also forming the group called Houtman's Abrolhos, and on nearly all the islands on this coast, there are considerable deposits of guano, with which small vessels are frequently loaded when other produce does not freely offer; the quality of the guano varies very much. King George's Sound is a considerable bay or harbour, to the eastward of Cape Leeuwin, and is principally known as the coaling station for the P. and O. mail steamers; the colonial vessels between Freemantle and Adelaide and Melbourne, frequently call on their passages, either way, to land and embark passengers and any cargo that may offer. It will be a long time before Port Eucla, at the head of the great Australian bight, can be made useful; it is just inside (westward) of the W. Australia boundary, but produce will inevitably be forwarded to the great shipping ports, and settlers will be very chary to go so far back in either province where they would find no outlet for their surplus stock, &c., without making new roads, and establishing a new port with all its difficulties and drawbacks.

1360. The pilot station for the harbour of Freemantle is situate at Rottness, an island eight miles to west-north-west of the anchorage, which is specially reserved as a convict station for the natives; the **pilotage** is so far compulsory, that if the pilot offers he is bound to be taken, and if a master takes his own vessel in, the pilotage will still be charged before the ship clears outward; coasters by paying an annual fee are exempt, but have to carry an exemption flag when entering the port; there is considerable expense and difficulty in getting fresh water, although there is a jetty built, and a large house with tanks on the south beach, from which pipes run to the end of the jetty; the management is entirely faulty, being in the hands of the harbour department, and the settlement being a penal one, red tape is paramount in every direction—that the want of free, and skilled labour keeps the colony back; population is alone wanted.

1361. **WHALEBONE**, if greased by oil casks, &c., will be considered “damaged by bad stowage.” If at all greased when received for shipment, a master should not sign for it as being in “good condition.”

1362. **Wharfage**. Exchequer, 13th May, 1804, *Sittings in Error*, before **BARON BRAMWELL**, and Justices **BLACKBURN**, **MELLOR**, and **SHEK**. The action was brought by the **SOUTHAMPTON DOCK COMPANY**, against **HILL** for £17 for wharfage of two packages, one containing a mirror, set with numerous diamonds, pearls, and precious stones, of the value of £4,600. The other article contained small property, an ornamented stereoscope, but of the value of £2,600. These articles were sent over by the Sultan of Turkey, for exhibition at the International Exhibition. Plaintiffs, made an *ad valorem* charge for wharfage of £17, but defendant refusing to pay, the present action was brought. It was shown that when these packages were landed, the Custom-house officers required them to be opened for their inspection, and they were then kept in the company's premises at their risk for a whole night. The case came on to be tried before Mr. Justice **WILLES**, when a verdict was taken for plaintiff, subject to the opinion of the Court of Common Pleas, upon the construction of the Company's Act, 6th Wm. IV., cap. 29, sec. 149, which empowered them to take certain rates for all articles not particularly set forth in the schedule, such sum as should be equal to the rate, or sum affixed on goods, &c., “of a similar nature, package, value, and quality, to those specified in the schedule.” The Chief Justice of the Common Pleas, in delivering judgment, said, that no doubt the company ought to be compensated in some measure according to the value of the article, and the risk incurred, and he thought this charge a reasonable one, but the question was whether the company had a right to make the charge. One of these articles was such as had never been exported before; it was a looking-glass in a frame, set with precious stones, and was not enumerated in the schedule. That being so, the company were empowered by the 149th section to charge the same as they would for articles “likeliest” to them in nature, package, value, and quality; but there was nothing in the statute to entitle the company to make an *ad valorem* charge. He could not but think, however, that this charge was a reasonable one, and he had done

all he could to find something in the Act of Parliament, to support the company in it, but not having been able to do so, the rule must be made absolute to enter the verdict for the defendant.

Mr. LUSH, Q.C., now argued that the Company had a right to make this charge at common law, as there was nothing in the schedule at all like these articles. By the judgment of the Court below the Company were not entitled to charge anything. The Company had to unship the articles, to have the packages opened and to keep them at their risk, the articles being of that nature which made them particularly subject to theft. There was nothing at all like them in the schedule, unless a cow could be likened to the hippopotamus. Mr. M. SMITH, Q.C., said they might be taken under the head of curiosities, or furniture. The Judges, after retiring, said they need not hear Mr. SMITH, and they then delivered a judgment in almost the words of that of the Lord Chief Justice ERLK. Judgment affirmed.

1363. WINE ; see spirits.

1364. WINGERS, small casks stowed close to the side in the hold where larger casks would cause too great a rising in that part of the tier.

1365. WIRE. Weight of 100 lineal feet B. W. gauge diameter '137, iron 4'965, steel 5'020, brass 5'427, copper 5'710. The weight of a lineal foot of copper bar 1 inch diameter is round, 3'027 lbs., and square 3'854 ; brass, round 2'863, and square 3'646.

1366. WOOD, UNRATED. Bombay ton 14 cwt.

1367. WOODEN SHIPS. Mr. GRANTHAM, C.E., says, that the tree which is intended for a timber-built ship, is no sooner felled than the oxygen, which, during vegetation, is held in harmless combination, begins its work of decay. The gradual combustion and deterioration of the woody fibre supervenes ; carbonic acid is evolved ; and the wood, becoming carbonised, loses its flexibility and strength. The progress of this decay is sure, though by care, its effects may be retarded ; but, from the numerous instances of its rapid increase, even in well-built vessels, we are led to conclude that no human foresight can prevent its poison from spreading in every direction. Some kinds of timber are much more liable to this defect than others ; its progress is increased by neglect and a want of air. But when dry rot has once commenced, a ship's character for seaworthiness is lost, and she can no longer be depended upon ; for it is often found that she is weakened in the most vital points ; that those parts on which her safety mainly depends, are decayed ; and that some unusual and casual strain is alone required to complete her destruction. [An experienced ship-builder considers that the decay mentioned by Mr. GRANTHAM, is confined principally to aged timber.]

1368. Dry rot in British-built ships may, as a rule, be attributed to the use of unseasoned oak timber* and the neglect of the proper means of ventilation, which can readily be provided for by openings in the ceiling. There are, however, some kinds of timber so predisposed to dry rot, that no precaution can save from rapid decay, and a single piece of it in a ship will inoculate adjoining parts, and thus make extensive ravages. But this sort of timber is easily known by its colour and open grain, and should be carefully avoided. Dry rot is best prevented by salting; see the article salting. Whale oil is said to be so good a preservative of timber, that no whale vessel is ever touched with dry rot.

1369. Wood dries more rapidly the longer it has previously remained under water, because the water constantly changes all round the submerged parts, and eventually takes the place of the sap, which issues forth and carries with it the fermenting properties with which it is charged. As pure water evaporates with greater rapidity than that which contains foreign matters, the previously submerged timber is sooner seasoned.

1370. Mr. BLACKBURN, in his treatise on *Shipbuilding*, very properly notices, that in constructing ships, care must be taken not to place together those kinds of timber which are known to disagree in their nature, and to destroy each other. The oak of Northern Europe and that of North America, prove extremely pernicious to our native oak; a decayed piece of timber placed in contact will hasten the destruction of a sound piece; when absolutely necessary to place them together, a piece of hair felt between may diminish the injury.

1371. It is stated that *Teak* which has not been tapped before felling, will not rust iron; the oil in the wood keeps the ship's bolts so clean that where they have been used fifteen years for poop fastenings, they have come out almost as clean as when driven in. *Teak* timber is occasionally bored into by some perforating insect which seldom takes a course directly across the trunk. The perforations average half an inch in diameter; sometimes they are much larger, and frequently the perforations are larger in the interior, than at the entrance—perhaps through the growth of the insect. The dirt attached to the exterior and the smallness of the exterior holes, often prevent their being discovered in a bulk. *Teak* planks thus perforated have been used in the construction of ships, and the concealed

* Some builders consider that ships built under close roofs are more liable to dry rot, because when dampness gets in while building, the sun and wind cannot reach the frames to dry them.

leak has involved great loss on the owner, in consequence of the difficulty of discovering its exact position.

1372. The thickness of wood, either as applied to planking or framing, does not increase its durability in a like proportion, but from the difficulty of thoroughly seasoning it when it is of great thickness, or of admitting air to preserve it from damp, is rather detrimental, and thus the small vessel becomes as durable, or even more so, than the large vessel.

1373. The action of iron fastenings is sometimes found to be as injurious to the wood as that of the wood is to the iron ; and thus one of the main sources of support to a timber-built ship not only accelerates her decay, but is, in its turn, destroyed with equal rapidity by the wood. An iron bolt of an inch diameter, which secured an iron knee to the oak rib of a well-known steamer, was found after three years, decayed in the wood but sound in the iron knee. It was much above the water-line, and not near the copper ; and was probably destroyed by the acid of the oak.

1374. Mr. KUHLMAN asserts that the use of iron nails in building wooden ships is one of the chief causes of their decay. The rotting or decay of wood is a process of slow combustion, and he considers that the iron nails act as carriers for oxygen, and introduce it into the substance of the timber. By contact with water and air, the iron is rapidly converted into a sesquioxide. In this state it yields a portion of its oxygen to the wood, and is reduced to the state of protoxide, which further action of air and moisture converts to the sesquioxide, and so the process goes on. Mr. KUHLMAN fortifies his theory with several experiments, and appeals to the well-known blackened and rotten appearance of ship planks that have been long in contact with iron nails or bolts.

1375. Mr. CREUZE says :—" The metallic fastenings to a timber-built vessel act, it must be remembered, not only chemically, but also mechanically, to accelerate her destruction so soon as the close connection of several parts is at all diminished."

1376. Mr. GRANGE in his Hints to Young Masters, says :—" The masts of merchant ships are generally made of yellow pine, in one piece ; five or six years is about the average time they stand good. They generally begin to rot about the cheeks, trussel-trees, and heel. And this is generally supposed to be brought about by wet. This, however, is questionable, as the kind of wood, the cheeks, trussel-trees, or step is made of has much to do with the decay. It has been remarked, that American red oak cheeks have ruined a mast in three years. Capt. BROWN, of the barque *Sunda*, had his lower-masts

made so that the masts formed their own cheeks—the spar being large enough for that purpose. These were justly esteemed by many, and on this principle any mast may be made. All that is required is to find sufficient support for the topmast; and this may be done even without the aid of trussel-trees as now made, viz. :—make an iron cap to fit the mast at the hounds, the mast increasing at the neck and hoop, with gaining sides; have a notch cut in the aft part of lower-mast four feet above the hounds, and a like notch made in the fore part of heel of topmast two feet lower down; get a large shackle, to shackle, as I may say, the two masts together—this to have the entire weight of the top-masts. The gaining hoop that goes on the masthead to have the weight of the mainyard."

1377. WOOL. Large quantities are exported from Australia; in all the colonies there it is sold at per lb., with an allowance in weight for the actual tare, and an additional allowance of 1 lb. $\frac{1}{2}$ cwt. for draught; freight usually 20 cwt. $\frac{1}{2}$ ton; the principal difference in the character of the colonies is caused by the soil and the climate. In New South Wales fruit is superior, especially grapes, which yield delicious wines; potatoes do not succeed there, while they flourish in Victoria. Bark is too bulky for export unless the European markets range high. Red gum timber, harder than teak, and capable of being highly polished, proves too brittle for conversion into household furniture. Stock or lean cattle bred in New South Wales, are generally paid for in specie, and are fattened in Victoria, which often exchanges them for South Australian grain, considered more plentiful than in all the other colonies united; copper ores are equally abundant. In Victoria distilleries and sugar refineries are successful; the manufacture of paper, cloth, and earthenware is progressing. Tasmanian apples excel those of Hereford or Devon. Large quantities of preserved meats are also exported to Europe.

NEW SOUTH WALES; the bales of wool are 2 to 3 $\frac{1}{2}$ and even 4 cwt.—the average is about 3 cwt. The harvest for wool and grain is in December. Shearing commences in October, and should be over by December; if it is deferred various grass seeds get into the wool, particularly the *Anthisteria Australis*, or kangaroo grass. *Sydney*; the season of shipment is from 1st November to March 1st; the principal month is January.

VICTORIA; since 1840 the seasons here have undergone great change, caused chiefly, it is said, by the extinction of the forests to provide fuel for the numerous gold diggers, &c. The temperature has become colder; snow and ice are now seen, and frost is common. The difference of the season for wool and grain, as between Victoria and New South Wales is very little, no more than that between Northum-

berland and Devonshire. Victoria is a trifle later, but of the same duration ; its wool is said to be equal in quantity to that of the two adjoining colonies. *Melbourne* ; the season for shipment extends from 15th October to 1st April ; the bulk of the shipments are over by the 15th of February.

SOUTH AUSTRALIA : wool is usually made up in dumps bound round with iron bands, measuring 2 feet 3 inches long by 2 feet 9 inches broad, and 2 feet deep ; weight greasy say 400 lbs., washed 300 lbs. Clipping continues from 15th September to 31st December ; shipments go on to 28th February. At *Adelaide* the average weight of 35,884 bales shipped in the three years ending in 1862, was 362 lbs. $\frac{1}{2}$ bale.

NEW ZEALAND ; bales are generally small, seldom exceeding $2\frac{1}{2}$ cwt. The new clip is in November and December ; shipments nearly all the year. *Otago* ; 1,004 bales and 3 half-bales shipped in February, 1860, averaged 323 lbs. ; the season for shipment is stated to be from December to May inclusive, *Lyttleton* ; 611 bales shipped in December, 1859, averaged 334 lbs. $\frac{1}{2}$ bale. *Port Chalmers* ; 740 bales greased averaged 435 lbs. ; 1,079 washed 336 lbs.

CAPE OF GOOD HOPE ; the shipments are few, and occur all the year round. *Algoa Bay* ; the bales are 200 to 336 lbs. each, pressed and fastened with iron bands ; the weather is very uncertain, sometimes there are great floods, at others droughts ; when a drought follows an ordinary good harvest, there is no nourishment for the cattle which convey the wool, &c., to the sea-side ; the seasons of shipment are consequently uncertain.

PERU ; at *Arica* and *Islay* the clip is generally in November, December, and January ; bales of alpaca weigh 150 to 180 lbs. each ; about 3 feet by 2 feet.

SEA OF AZOF ; wool is shipped principally after July—in the autumn.

A ship with a cargo of wool requires about two-thirds the quantity of *ballast* necessary when in ballast only ; it should be as dry as possible, and levelled fore and aft. Some experienced masters contend that cargoes of wool, like cotton, require for dead-weight, if the ship is tolerably stiff, not less than one-third her register tonnage ; tender ships require more. Pig iron or kentledge, if it can be obtained, is the most economical, as by its use a height of bales of wool may be saved ; this cannot be done with lighter ballast. The dunnage for the ground tiers should be laid as the bales are being stowed, the depth (if the ballast be perfectly dry) need not exceed three inches ; this will keep the wrappers of the bales clear. Should the ballast be the least damp, as great a depth of dunnage must be laid as the heights will allow without loss of stowage, for wool will draw moisture from any damp substance near ; although the bale may not touch the ballast, yet the wrapper will become damp, heated, and rotten ; this of itself constitutes "damage," and the wool shares the same fate to

a greater or lesser extent. "Stow" or "fathom" wood, when dry, is sometimes used for dunnage, there is generally a quantity on board; it does not however lay very evenly; gum-wood treenails in the rough are also used—they are produced in the colonies, and sell well at home; this is also the case with iron bark timber, which answers the purpose of ballast, and is excellent dunnage for wool. At Geelong, Melbourne, and Sydney, copper ore from South Australia and New Zealand is frequently taken for ballast. The wing bales of the ground tier should be *dunnaged* at least nine inches at the lower corners in the bilge, increased to 12 inches in the shoulders, and gradually decreased to three inches up the sides. The breast-hooks, pointers, pump-well, chain-lockers, masts, and hold stanchions should be carefully dunnaged as the cargo is being stowed, and bales should not be allowed to touch iron knees.

1378. The *packing* of colonial bales has been much improved lately, both as regards their form and pressing: it is now usual to compress them on shore by hydraulic power, and to lash them with Manila or New Zealand strands, or hoop iron, at the ship's expense. The bales are generally pressed on their flats, but sometimes for the sake of stowage, on their ends, when they are termed "dumps;" for the same reason two are frequently pressed together side by side, and are called double bales; they are secured with from four lashings to as many as may be considered necessary, and should be stowed immediately after being pressed, for if left any time, especially in the sun, the wool swells and sometimes breaks the lashings, when it must be re-pressed or stowed disadvantageously. New Zealand lashing is now chiefly used for baleing at Sydney, but galvanized iron hoops would probably be better, as they will not "give" after being pressed; there are from eight to twelve lashings to each package of Sydney wool, which are called single dumps, doubles, trebles, or fourbles, according to the number lashed together; trebles are the most numerous. Two lashings at least should be left on each bale, or the contents will be so disarranged, if not diminished, when breaking out for discharge, as to cause trouble and inconvenience to all parties concerned, and justify claims for damage from the consignee. At Melbourne, where the New Zealand hemp lashings were worth £25 $\frac{1}{2}$ ton in 1865, the stevedores who contract for stowing the cargo, are tempted to "draw" more lashings than they are entitled to by their agreement, through which the wool is greatly damaged, especially when discharging.

1379. The ballast for a cargo of wool, like that for a cargo of tea, should be levelled so as to be equi-distant from all parts of the

beams above, in other words, so as to meet their sweep or bevel, or great loss of stowage space must occur on reaching the upper tier under the beams. The method of *stowing* is by commencing each tier at both ends, and by heaving off every longer with quarter trunks, excepting the ground tier, as it is more liable to rise in the wings than the tiers over it. To make good stowage, it is necessary as each tier is being stowed, to use screws of different lengths, from six inches up to four feet, together with "sampson posts" and "trunk planks," &c. ; the planks are of hard wood six or eight feet long, nine inches broad, by two and a half or three inches thick, with a hole in the end, the use of which will be explained hereafter ; two, sometimes four, of these planks are inserted between any bales of a tier which are selected to be "screwed off," and placed, if only two are used, against the middle of their sides respectively ; between them is entered a short screw, which when hove out is succeeded by others of greater length, until the bales are forced sufficiently apart to admit of another being entered between the planks, and forced in by the aid of a screw "set" against a sampson post. When the tier has been thus increased by the additional bales, it becomes so tightened as to require two and eventually four screws to set the bales apart ; in the latter case four planks are so placed as to distribute the pressure equally against the "trunk bales," as the term is. The smooth surface of the planks materially assist the slipping of the bales, while being forced into their berth in the "trunk way," which gradually eases the screws and admits of their removal. When cargo such as wool has not been fixed (by screw or otherwise) sufficiently tight against the sides, the dunnage has subsequently slipped down by the motion of the ship at sea, and the goods have been injured by leakage, &c. On account of the high rate of wages at Sydney, stevedores will not "screw off" now so willingly as they did formerly.

1380. It sometimes occurs that the tiers have a tendency to rise, when it is necessary to use toms or shores from the beams, together with a screw forcing downwards. This operation must, however, only be done when absolutely necessary, and then with great caution, or the decks will be injuriously raised. "Tomming off" is frequently required when renewing the screws, and on various occasions incidental to the work, and for the safety of those employed, particularly when screwing in the "trunk." Great care is necessary in setting the screws to prevent their capsizing, for the collapse of the tier, from the great elasticity of the wool, has sometimes caused fatal accidents. The bale being stowed, the planks are drawn out by a

tackle attached to the hole previously mentioned. A gang of stowers (which usually consists of four men for the hold) may be employed with advantage at each end of the ship for the ground tier; and when a few tiers are advanced, other two gangs can be employed at the next or second tier, and two or more gangs in the 'tween decks, if they are laid. The quantity a gang can stow varies considerably, being dependent on the amount of screwing, &c.; some bales requiring much more than others. Through deficiency of height under the break of a forecastle or half-deck, or various beams, it is necessary frequently to screw *down* for stowage, for which bales screwed on end, and termed dumps, are particularly adapted; this is a tedious operation requiring great care, as every bale has to be secured down in its individual tier by toms, until the last bale is got in. Care should be taken to shore from beam to beam, in the wake of the screws; and the extent of screwing should be regulated by the strength of the beams, against which the screws are "set." Occasionally the lashings are cut after a bale is stowed, in order to keep it firmly in its place, as on being released it immediately jams itself into the space intended for it; some, however, contend as has been already stated, that two lashings should always be left on each package; they would keep the strain off from the sides of the vessel; ships have had to pay heavily for damage to wool caused by cutting the bales adrift; consignees will at times refuse to receive them in that condition. Merchants contend that bales should not be pressed in any other direction than that in which the wool was packed into them.

1381. In stowing wool near the *water tanks*, great care is necessary to prevent their becoming leaky by over pressure, or the water will be lost and the wool damaged. The tiers before the tank should be screwed tight enough from side to side, to prevent their starting by any pitching of the ship, and those stowed each side should be well secured by pressure fore and aft. In this case the chain lockers are supposed to be each side of the mainmast, and the tank forward of all. It is not considered prudent to cut the bands of bales stowed in the *'tween decks*, because the deck planking being only fastened above, is consequently weak against any upward pressure; the deck planks may be started. The heat of, and steam from, cargoes of wool, sometimes warp the decks.

1382. Wool should, if possible, be shipped *dry*, when wet, it is liable to spontaneous combustion; several ships leaving Australia have been destroyed through inattention to this important point. Some Australian agriculturists contend that the principal if not the

only cause of spontaneous combustion, arises from the practice of clipping sheep in the morning with the previous night's dew on ; if placed under a shed the danger is considerably decreased or avoided altogether. Care should be taken to ascertain that every bale is dry in the *heart* ; the usual mode of testing is with a rod. Wool frequently gets wet and damaged on the drays, on its way from the interior of the country ; it then becomes dry outside, and too frequently reaches the ship for stowage in this dangerous condition. Spontaneous combustion may ensue, especially on such a long voyage as to England, in which so many changes of temperature occur ; it begins to smoulder first in the centre of the bale. Mates ought not to receive a wet package under any circumstances ; they should see that all the cargo is perfectly secured from rain, and off the ground, when giving a receipt for it ; and stevedores should be urged to stow the same as soon as possible. If spontaneous combustion occurs the fire may not come out in a blaze immediately ; in 1846, a cargo smouldered for 70 days ; her beams were converted into charcoal, but there was no flame. The details of some important instances of spontaneous combustion will be found towards the close of this article.

1383. Masters should be careful in shipping wool which has not been properly cleansed from *grease* ; the inducement to do which, in preference to clean wool, is the greater amount of freight it pays through being heavier. When labour in the colonies is scarce, the quantity of greasy wool is increased to the disadvantage of the grower, who has to pay freight for grease and dirt, &c. The ship is benefited by the dirty wool, provided spontaneous combustion does not occur ; some Sydney colonists doubt the possibility of such an occurrence unless it be wet. Washed wool, thoroughly dried, may be regarded as free from this risk, unless tar, oil, &c., is spilled on it. It is usually freighted at 4 lb. ; *very* greasy wool 25 p cent. less than clean.

1384. As the stowage of an Australian wool cargo is tedious, and usually occupies much time, it is highly necessary that the topsides and decks of the ship should be well caulked, in harbour, just before sailing, and after all the cargo is in, as the pressing requisite for stowing the upper bales, may have opened the seams. It frequently happens in high southern latitudes, that the ship has to experience very heavy gales during the whole of her passage eastward to Cape Horn. The slightest neglect in the caulking would be sure to cause serious damage to cargo, and cannot be remedied at sea.

1385. Vessels loading **Sydney** wool generally obtain dead-weight of hides, tallow, &c. Hides are sometimes spread out flat and salted

in the hold, but generally ashore ; they are levelled off with treenails, a sufficient depth to keep the wool apart : hides form an excellent dead-weight, are sometimes stowed in blocks, and are very useful for trimming the ship. When casks of tallow are used they are always well coopered before shipment, and common bones or hoofs are stowed in the cantlines. On this surface is placed treenails, spokes, rattans, ox horns, shank bones, or any other cargo that will not damage, and the whole is covered to prevent contact with the outsides of the wool bales ; horns must be kept clear of tallow, which may injure them. Wool should never be stowed on oil, as the casks are then likely to become very dry and leakage will ensue ; the unevenness of stow-wood does not prevent it from being good dunnage for casks of oil. Common mats from the East Indies or Manilla are easily obtained at Sydney, and are used advantageously on the dunnage. It is usual to agree with the stevedores to stow the whole cargo at $\frac{1}{2}$ ton for oil, tallow, hides, bones, and measurement goods ; and at $\frac{1}{4}$ bale, large or small for wool. Three average bales of Sydney wool, if properly pressed, will occupy about 40 cubic feet. Fellmongers' wool (the wool taken from dead skins) is shipped from Sydney and Melbourne all the year round, principally from April to October or November ; the shipments, however, then only average about 500 bales $\frac{1}{2}$ month ; fellmongers' wool, greasy or clean, weighs and measures about the same as other wool.

1386. The ship *Duncan Dunbar*, Capt. SWANSON, took in at **Sydney** in February, 1864, 3,120 bales wool and 391 casks tallow, 300 cabin and 100 steerage passengers, which, with 400 tons of ballast, made her draught 17 feet 8 inches aft and 17 feet 6 inches forward. With a full dead-weight cargo she drew 20 feet fore and aft. The ballast consisted of 100 tons London kentledge, 250 tons Sydney blue stone, and 50 tons old gun carriages. The *Duncan Dunbar* registered 1,374 tons, was 229 feet 2 inches long, 36 $\frac{1}{2}$ feet broad, and 23 deep. **Port charges** at Sydney, in, with 2,000 tons general cargo, and out, *nil* ; **Pilotage** in £22, out £22.

1387. The ship *Transatlantic*, 614 tons register, Capt. W. PHILIP, belonging to Messrs. G. THOMPSON, junr., and Co., of London, took in at **Sydney**, June, 1864—

1,360	Bales wool,
136	Casks tallow,
5,300	Hides,
300	Bags and 40 cases kauri gum, and
60	Tons iron-bark timber.

She is 150 feet long, 29'3 feet broad, and 17'9 deep ; there was no

ballast ; dunnage wood, bottom 9 inches, bilges 12, one treenail between the wool and the sides. So laden, she drew $14\frac{1}{2}$ feet aft, 14 forward ; and on arrival in London, 13th October, $14\frac{1}{2}$ feet aft, 13 feet 10 forward. With 780 tons guano, loaded at Callao in 1860, 16 feet ; best trim at sea 6 inches by the stern. **Port charges at Sydney**, customs entry and shipping office, £4 4s. **Pilotage in 4d.** $\frac{1}{2}$ ton ; out the same.

1388. The ship *Queen of Nations*, THOMAS MITCHELL, Master, belonging to Messrs. G. THOMPSON and Co., of Leadenhall Street, left **Sydney**, 21st September, 1865, and arrived in London, 20th December, with

484	Bales of wool,
44	Bales of cotton,
1,037	Casks cocoa-nut oil,
219	Casks tallow,
2,602	Ingots and plates copper,
62	Tons gum, and
9,452	Hides.

Ballast, 30 tons of kentledge ; dunnage, treenails and bones, 12 inches in the bottom, 18 in the bilges, and 6 in the sides. The hides were laid from two beams abaft the foremast to the mizen-mast ; oil on the hides, with a tier of tallow between ; the wool, cotton, gum, &c., in the 'tween decks. The ship registers 846 tons, is 190 feet long, 32'3 broad, and 20 deep ; 'tween decks 7 feet. So laden she drew $18\frac{1}{2}$ feet aft and 18 forward ; her best trim is 9 inches by the stern. **Pilotage in £14 2s.**, out £14 2s.

1389. **Sydney cargo.** In the Court of Exchequer, 4th February, 1865, before Lord Justice ERLE. *PUST v. DOWIE*. By a charter-party for a voyage from Liverpool to Sydney, the charterer agreed to pay for the use of the ship £1,500 in full, on condition of her carrying a cargo of not less than 1,500 tons weight and measurement. It was held in the Court below that this was to be taken in the ordinary proportions, according to the port of lading—viz., one-third weight, two-thirds measurement, and had no reference to a cargo for the Sydney market in which the proportions were ordinarily one-third measurement and two-thirds weight. On this holding, which was for the plaintiff, there was this appeal. Chief Justice ERLE said that he and the other six judges assisting, were of opinion that the judgment of the Court below ought to be affirmed.

1390. The ship *Omar Pasha*, Capt. THOMAS HENRY, belonging to Messrs. G. THOMSON, SONS, and Co., Aberdeen, took in at **Melbourne**, in October, 1864—

3,550	Bales of wool,
14,000	Hides,
80	Casks tallow,
20	Tons spelter, with
4,000	Ounces gold, and
12	Cabin passengers.

She registers 1,068 tons, is 207 feet long, 36 broad, and 22 deep; 'tween decks 6½ feet; with the above she drew 19 feet aft and 18 feet 9 inches forward, her best trim at sea; with a dead-weight cargo she draws 21 feet. The ballast of stones, spelter, and hides, was estimated at 430 tons. The wool was screwed in; and the dunnage, stones and horns, was 12 inches thick in the bottom, and 15 in the bilges; in the sides horns only. **Port charges** 1s. 6d. ton; **pilotage** in £28 18s. 6d., out £28 18s. 6d.

1391. The ship *Lincolnshire*, 1,024 tons, Capt. H. SHINNER, belonging to Messrs. MONEY, WIGRAM, and SON, of Blackwall, left **Melbourne**, 10th November, 1864, with

2,000	Bales of wool,
125	Casks tallow,
115	Quarter-casks whiskey,
30	Tons case goods,
9,800	Ounces gold dust, and
130	Passengers, with the requisite water and stores.

She had also 141 tons kentledge and 150 tons stone ballast, which was levelled to receive tallow at the fore end, spirit aft, and wool dumped and screwed the whole length of the ship. So laden, she drew 17 feet 2 inches aft, 16 feet 9 forward; on arrival in London, 25th January, 1865, 16 feet 9 inches aft, 16 feet 10 forward; her best trim is 16½ feet fore and aft. **Pilotage** at Melbourne, in and out £42.

1392. Some ships from **Adelaide** refuse all cargo except wool, with copper ore as ballast; occasionally salted hides, tallow, or gums, can be had for ballast; also silver lead ore in small quantities. Ships stowing wool with copper ore for ballast, sometimes start the bags, and let the ore fall in the crevices between the bales; this is very reprehensible, because ore is generally damp, if not wet, when shipped, and it must, therefore, damage the wool. When a ship takes bark here in bages or bales, permission should be obtained, on the bill of lading, to cut the packages. If not obtained and the packages are cut, the ship will be liable to make good for loss of weight and other damage. In 1865, the charges for towing vessels

to and from the Lightship were considered excessive, being 7*d.* $\frac{1}{2}$ ton for a distance of nine miles. Most of the vessels trading to and from London are built expressly for the trade; they are thus enabled to turn out large cargoes. Ships generally turn out considerably over their intake weight. In many instances wool is dumped on the station for convenience of land carriage; the ship allows the cost, say 1*s.* 8*d.* to 2*s.* $\frac{1}{2}$ bale. As a rule, ships will stow four bales per register ton if they take a full cargo of wool. Ships loading at Port Wakefield, which seldom exceed three or four each season, or at Port Augusta, can generally obtain one-eighth $\frac{1}{8}$ lb. freight more for wool than at Adelaide.

Reg. tonnage.	Voyage.	Bales of Wool.	Shipping Weights.	Landing Weights.	Overplus.	Bale of washed averaged.	Greased averaged.	Average weight of bale.	Ballast (copper ore).
			lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	tons.
555	1	2,266	796,848	805,166	8,318	283	428	354	140
"	2	—	769,533	786,682	17,149	—	—	—	187
"	3	—	898,881	920,904	22,023	—	—	—	240
630	-	2,292	889,560	894,983	5,423	288	425	—	221
562	-	2,183	859,759	875,482	15,723	293	432	—	70
697	-	2,958	1,123,514	1,145,335	21,821	—	—	—	58
400	-	1,433	548,339	542,400	4,061	—	—	—	158
					Decrease				
351	-	1,521	639,576	603,152	36,424	—	—	—	—
762	-	3,332	—	—	—	—	—	—	276

1393. An experienced master says—"When masters are under charter and bound to the charterer's agent at Adelaide, they are bound to have their outward business done through that agent. If masters prefer on discharge of inward cargo to procure a homeward freight through a different channel, the inward broker can by the custom of the colony, demand the usual commission on the amount of freight grossed by the ship homeward. This claim may not become known to inexperienced masters until their ships are ready for sea. It will be necessary to observe caution before signing such charter-parties." Upon this another master observes, "I have always understood that if the charterer's agent cannot find employment for the ship outward, and if the master has to look elsewhere for freight, then the inward and outward brokers divide commission."

1394. In December, 1863, one of the Orient line of ships, the *Murray*, Capt. J. LEGOE, belonging to Messrs. ANDERSON, THOMSON and Co., of Billiter Court, London, left **Adelaide** with

3,182	Bales wool,
19,522	Ingots copper,
1,590	Bags silver lead ore,
473	Bags copper ore,
35	Boxes silver lead ore,
15	Bales leather,
277	Calf skins,
1,150	Horns,
16	Cases and 10 casks wine, and sundries.

The *Murray* registers 902·79 tons ; length of keel 180 feet, fore rake 13 feet, breadth 33½, depth of hold 20 feet 8 inches ; 'tween decks 7½ feet. So laden, she drew 16 feet 2 inches aft and 15½ feet forward, but there was 250 tons of cargo space occupied by passengers, of whom she had a full complement. With 300 tons dead-weight cargo and 1,190 tons measurement goods, she drew 16 feet 4 inches aft and 15 feet 8 forward, but there was 350 tons of cargo space for passengers. Her best draught for sailing is 15 feet 8 inches aft, and 15 feet forward. She carries a very large cargo on a very small draught ; and has a long floor with two sharp ends. She was built by Messrs. HALL, of Aberdeen, and has run 325 miles in 24 hours. **Port charges**, harbour dues, and light and tonnage dues £28 11s. 6d. ; **pilotage** in and out £17.

1395. The barque *Adamant*, 815 tons, Capt. B. LODWICK, R.N.R., belonging to Mr. HARRISON, Gloucester terrace, Regent's Park, London, left **Adelaide**, 8th January, 1865, with 273 tons of copper ore (in bags) for ballast, and to dunnage 3,500 bales of wool screwed in as usual. She had also 24 passengers, and so laden drew 16½ feet on an even keel ; on arrival in London in May, 15 feet 11 inches aft and 16 feet 2 inches forward ; her best trim at sea is 14½ feet aft and 14 forward. The barque is 174·9 feet long, 30 broad, 19·2 deep, 'tween decks 6 feet 9 inches ; she has loaded 1,132 tons of Calcutta cargo. The *Adamant* loaded partly at Port Wakefield, at the head of the Gulf of St. Vincent, six miles from land, and returned to Port Adelaide, where she completed her loading, which involved the cost of two pilotages and towages. Towing in and out of Port Adelaide twice, and one trip to bring off the passengers, £84 ; pilotage in and out £14 15s. ; pilotage in and out £15 10s. ; tonnage dues, 885 tons at 3d. ♂ ton, £10 3s. 9d. ; Marine Board £23 1s. ; wharfage 9d. ♂ ton ; entering and clearing £5 5s. The heaviest charges were those for dumping and stowing the wool—3s. 6d. ♂ bale at Port Adelaide, and 4s. at Port Wakefield, including lighterage ; in all, about £700. At Port Adelaide, the water being *soft*, the bottoms or iron ships are very liable to get fouled.

1396. In relation to the *packing* of **New Zealand** wool, Mr. HURSTHOUSE says, "the fleeces should not be tied with strings: the lint mixes with the wool, and makes what are called burls: no tying is requisite. The bales should be pressed about 300 lbs., in a small bale—a neat, square looking, well packed lot carries a better impress with it when care has been taken in the getting up, and is not unlikely to turn the scale in favour of the seller. It is sometimes found that a few greasy fleeces are packed with the washed; in all cases, this is a serious detriment to the whole. If a few unwashed sheep are shorn, and their fleeces are not sufficient to fill a bale, either retain them, put them among the locks and pieces, which nearly assimilate in value, or else pack them in a bale, and mark thus—

WASHED.
GREASE.

A similar course should be pursued in all cases where two kinds of wool are packed in the same bale. Occasionally when the wool arrives in England the brand is obliterated through getting wet on board; it is therefore recommended that both ends be marked. Never mark the bales on the sides only, as they are exhibited for sale end on."

1397. New Zealand wool has not hitherto been packed as well as that of Australia, owing to the want of suitable hydraulic presses and sheds. As the bales are usually pressed by the master, he should, if possible, be provided with two or more good wooden screws. A large portion of the cargo has to be collected from out-lying harbours.

1398. The *Star of Tasmania*, 632 tons, Capt. W. CULBERT, belonging to Mr. S. TULLOCH, of Launceston, Tasmania, left **Otago**, New Zealand, 2nd February, 1865, with 1,206 bales wool, 1,199 hides, a quantity of bones and horns, and 3,814 ounces gold dust. Ballast, 250 tons stone. Length 178 feet, breadth 30, and depth of hold 17·7 feet. So laden, she drew aft 16 feet 4 inches, forward 14 feet 4; and on arrival in London in May, 6 inches less; with 900 tons Newcastle coal she drew aft 18 feet, forward 16½ feet; her best draught is 18 inches by the stern.

1399. The barque *Witch of the Tees*, 300 tons register, Capt. BARTLEY, belonging to Messrs. BAKE and Co., of Philpot Lane,

loaded the first cargo of wool for England, at **Invercargill**, Southland, New Zealand, in March, 1864. She took 1,000 bales wool, 400 bales of hides and skins, and about 70 tons shingle ballast; and drew 10 feet aft and 9 forward; with 450 tons dead-weight 12 feet and 10 feet. She is 151 feet long, 22 broad, and 13 deep; 'tween decks 6 feet. **Port charges nil.** **Pilotage** in, £3 10s.; out, £3 10s.; the cost of towage is high, and it is scarcely possible to avoid towage. Invercargill is in a wild dangerous part of New Zealand, and good ground tackling is absolutely necessary. The average size of the bales of wool were 3 feet by 3 feet 10 inches, and 2 feet 10 inches; weight 320 lbs.; they were fastened with bands of native flax; **season of shipment** December to March.

1400. A ship of 518 tons register, arrived from **Port Chalmers** with 1,819 bales of wool weighing 305 tons 19 cwt. 0 qrs. 25 lbs., and six tons skins; no other cargo; with this the run was made to London in 84 days. The wool consisted of 740 bales of greased, averaging 435 lbs. $\frac{1}{2}$ bale, and 1,079 bales of washed, averaging 336 lbs. $\frac{1}{2}$ bale.

1401. A letter from a master, dated Lyttleton, 5th October, 1867, states that a ship 1,574 tons, ran into Lyttleton without a pilot, but nevertheless had to pay **pilotage** 6d. $\frac{1}{2}$ ton, £39 7s. The light dues are also high. Canterbury has several minor ports, where there are inter-provincial consignees, very dilatory in passing entries. The cargo is detained on board for lighters, the masters of which refuse to give receipts other than for large quantity in bad order. The proviso in the bill of lading "not accountable for breakage, leakage, or rust," is not considered of any value by the colonial justices, unless printed in the body. Owners are recommended, when chartering, to say "in default of entries being passed in a certain number of days, and lighters provided for moving such cargo, demurrage will be charged."

1402. In **Algoa Bay**, Cape of Good Hope, vessels are moored in an open roadstead, with open hawse to the south-east. The worst months are February and March, when the south-easters prevail. H.M.S. *Narcissus*, and the merchant ships *Susan Pardew*, *Graham's Town*, *Bermondsey*, and *Colgram*, parted there in February, 1864. The **seasons of shipment** are very irregular, the weather being uncertain. There are no port charges, and no compulsory pilotage. Cargo is brought off in boats carrying 50 to 100 bales, which weigh from 200 to 300 lbs. each, pressed, and fastened with iron bands. Of these a ship will usually stow three to the ton register; some ships $3\frac{1}{2}$, according to their build, and the quality and condition of

the wool. Flece-washed wool, washed on the sheep's back, will not stow so closely as soap-washed, which is done after clipping, but is much better as far as freight is concerned, as the bales are heavier and there is not much difference in the stowage. The weight of the bales of washed wool varies according to the skill or industry of the washer; in all cases, however, (of *washed* wools) fleece-washed is preferable as far as freight is concerned. Greased wool $\frac{3}{4}$ d. p lb. freight, will pay as well as, and in some cases better than, washed at 1d. When washed wool is freighted at 1d., skins, sheep and goat, range from £8 8s. to £10 10s. p 1,000. Bales of skins vary in quantity; some contain 50, others 75 and 100; they should never be opened, or disputes will arise on delivery. In stowing a cargo of wool and skins, the latter are generally used to fill the trunkway, after screwing off the wool. If there are more skins than wool, it is arranged so that the planks for screwing come against the wool, as the greasy nature of the skins causes the planks to slip when screwing hard. The barque *Excelsior*, 462 tons, Capt. HUNTER, belonging to Messrs. RODHAM and Co., of Scarborough, took in at **Algoa Bay**, 4th March, 1864, 1,550 bales wool, 222 bales skins, 76 bags coffee, with which and 160 tons ballast, she drew 14 feet 2 inches aft and 13 feet 8 forward; with 700 tons coal she drew 16 $\frac{1}{2}$ feet and 16 feet. She is 128 feet long, 28 broad, 18 $\frac{1}{2}$ deep, and has 7 feet 'tween decks.

1403. In 1864, the landing and shipping of cargo was conducted in large flat-bottomed surf boats or lighters carrying from 25 to 30 tons, most of them were sailing boats. Of these eleven belonged to Port Elizabeth, nine to Eastern Province, five to Wheatland, and eight to D. S. Dawson.

1404. At East London all communication with the shore is by means of large decked surf boats of some 30 tons burthen, which haul backwards and forwards with a 7-inch hawser running in rollers at the bow and stern, and extending from the jetty on the South side of the entrance to an anchor outside the bar, in about four fathoms. After crossing the bar these boats have a branch warp to a fair-way buoy, from whence they are hauled alongside the shipping for loading or discharge. Should the weather be fine, and the bar passable, the surf boats will possibly be at the outer buoy, from which to the ship it will be necessary to run a hawser, as the current at times sets so strong that it is quite impossible to tow boats against it. It would also be advisable to send a boat's crew to assist in warping the surf boats from the outer buoy to the ship.

Wool is shipped at Cape Town, and brought alongside the vessel in the docks.

At the Korie vessels of 12 feet draught can enter the river and moor to the wharf, and receive their wool alongside, secure from every wind. There is a tug steamer to take vessels in or out.

At Natal wool is also shipped from lighters, the vessel lying within the harbour. Vessels usually enter this harbour up to a draught of 13 feet, but the bar is somewhat uncertain.

Rates of freight at Algoa Bay, as elsewhere, vary according to the supply of tonnage, and are regulated in a great measure by those ruling at Mauritius or farther eastward. Unwashed wool has been taken from Algoa Bay as low as $\frac{3}{4}d.$ p lb. and washed $\frac{1}{4}d.$; again it has been as high as $\frac{3}{4}d.$ and $1\frac{1}{4}d.$ to $2d.$ p lb. , washed. Large shipments of unwashed are made to America at rates varying from eleven-sixteenths to three farthings or a penny p lb. —freight payable in British sovereigns, or approved bills on London at par.

TONNAGE SCALE FOR CARGO BOATS IN ALGOA BAY.

American ploughs ploughs	6	Machinery special charge	
Acids feet	20	Matches and fuses feet	20
Bark, pressed 600lbs., unpressed	300	Nuts lb.	800
Barley lb.	1,800	Oats lb.	1,500
Beef, 5 casks, 1 half ditto, or lb.	1,200	Pepper lb.	1,000
Beer, 3 hhd., or kilderkins	8	Pork, 4 casks, 8 $\frac{1}{4}$ -casks, or lb.	1,200
Bones, bags 1,000 lbs., loose lb.	700	Potatoes lb.	1,500
Bran lb.	1,200	Rags lb.	800
Bricks 400		Rice lb.	2,000
Biscuit, 8 barrels, or lb.	1,200	Rope, coir lb.	1,200
Butter lb.	1,200	Salt lb.	2,000
Casks (empty) 1s. each to hhds. or half pipes; larger extra		Seeds lb.	1,500
Coffee lb.	2,200	Shells, 13 gunny bags or ... lb.	1,000
Fish lb.	1,200	Shooks 12	
Flour, 12 $\frac{1}{4}$ -bar. or barrels	8	Slates 500	
Ginger 1,000lbs., Gunpowder lb.	1,000	Skins, wildebeeste or other large	50
Hay, oat or other ... pressed lb.	600	Do, wildebeeste pressed 75	
Ditto unpressed lb.	300	Do. buck, sheep, goat, &c. ... 300	
Hides, dry 50; wet lb.	2,000	Soap, boxes not exceeding 56lb.	30
Horns, ox or cow lb.	500	Tobacco, in bales lb.	1,200
Ivory lb.	1,000	Tallow lb.	1,260
Iron pots 40		Tar, 8 $\frac{1}{4}$ -bar. or barrels	5
Iron pots, soap, and other large p measurement feet	40	Wines and Spirits:—Ankers ... 12	
Lard lb.	2,000	Do. $\frac{1}{4}$ -aums or octaves, ankers	8
Leather $\frac{1}{4}$ -sides	50	Do. Quarter casks ... $\frac{1}{4}$ -casks	5
Lime muids	10	Do. Hogsheads hhd.	3
Liquid, in wicker bottles, jars or tins gallons	40	Wool, washed and pressed ... lb.	600
		Do. washed and unpressed ... 400	
		Do. unwashed and pressed ... 800	
		Do. unwashed and unpressed	535

All wool to be deemed washed unless notice be given previous to shipment. Exceptional cases by special arrangement. Other articles per ton 40 feet measurement, or 2,000 lbs. weight. All weight is understood to be gross English. The Company reserve to themselves the right to charge either per measurement or weight. In case of landing or shipping horses or cattle, extra charge will be made for small numbers, while an allowance will be made on large shipments. The Company do not hold themselves responsible for breakage and other loss on slates, or injury to live stock.

ALGOA BAY AVERAGE RATES OF FREIGHT TO LONDON.

For washed wool in bales, pressed, from 245 @ 260 lbs., English	£ 4 @ 3d. ½ lb. gr. at Queen's Beam, with 5 ½ ct. primage & average customary
Unwashed wool, do. do. 480 @ 520 lbs.	£ 4 @ 3d. ditto ditto.
Goat & Sheepskins, bundles of 100 ea.	£ 7 to £ 9 the 1,000.
Aloes, cases weighing 350 @ 375 lbs. at	15 @ 20s. ½ ton of 20 cwt.
Wet hides, ox & cow. bundles of 20 cwt.	30 @ 35s. ½ ton of 20 cwt.
Horns (ox or cow)	25 @ 30s. ½ 1,000 horns.
Ivory	50 @ 60s. ½ ton of 20 cwt.
Measurement goods	46 @ 50s. ½ 42 cubic feet.

COMMISSION AT ALGOA BAY IN 1864.

On ship's disbursements	£ 5 ½ cent.
Ditto, if funds in hand	2½ "
On procuring freight	5 "
On collecting freight for ships bound to this place	2½ "
For passage money, obtaining passages	5 "

Stevedores' Charges, including all necessary gear, labour, &c.—8d. ½ bale for wool washed and unwashed; 8d. ½ 1,000 goat and sheepskins; 2s. 6d. ½ 100 hides. 3½ bales of unwashed wool may be reckoned to the registered tonnage; and 3½ bales washed. One bundle of 100 woolled sheepskins equal to one bale wool for stowing; 10 bundles (of 100 each) goat skins to 6 bales wool; 15 bundles hides to one bale wool.

CHARGES FOR WOOL PRESSING AT ALGOA BAY IN 1864.

	s. d.		s. d.
Pressing, ½ bale, grease	3 0	Storing after first week	0 2
" " washed	2 6	Sorting, ½ 100 lbs. washed	2 0
Repacking, ½ bale	3 0	" " grease	1 6
Weighing ditto	0 2	Skins, pressing, ½ bundle	3 0
Marking ditto	0 1	Poisoning, ½ 100	1 6
Sending to market ditto	1 0	Sorting, ½ 100	1 0
Carting from market ditto	0 3	Sending to market, ½ 100	1 0

The average weight of 30,562 bales wool shipped in 1864, was 275 lbs.; of 2,071 bags sugar, in 1862, 164 lbs.; of 49 bags of coffee in 1862, 162 lbs.; the average passage of 345 sailing vessels, from 1856 to 1862, from London to Algoa Bay, was 80½ days. [Much of the above is extracted from a work carefully compiled by Mr. W. FLEMING (Messrs. BLAINE and Co.), of Port Elizabeth, and of Fenchurch Street, London.] It is stated that the rates of freight of wool ½ lb. were in 1866 more advantageous to the merchant than in 1864.

1405. **Alpaca wool**, shipped at the port of Islay, Peru, (the only commodity shipped there) is very valuable; the bales, 150 to 180 lbs. each, are about three feet by two feet in size, packed so small to suit the conveyance by mules, which is the only mode used, and is perhaps the best, considering the mountainous country over which these animals have to travel for hundreds of miles; not being dumped this wool occupies more space proportionately than that shipped in Australia. Sometimes ships with a dead-weight cargo of nitrate, say at Iquique, proceed to Arica (or and) Islay, to fill up with alpaca wool. Vessels filled up with this wool should be supplied with ventilators either on the hatches or screwed to the deck, fitted to keep open in any weather; they are made of circular iron tubing, about one foot in diameter, and stand five feet high, with a revolving bonnet over all. Deck ventilators are the best; two are sufficient. Alpaca wool (like saltpetre) is brought to the port of Pisagua, in small bundles, which are sometimes opened, re-packed in larger bales, and hydraulically pressed for stowage. The clip is chiefly in November, December, and January. See Mr. COURT's letter in the article ores. In hides reference is made to bales of wood at Buenos Ayres.

1406. **Morocco**. Where a vessel has been chartered from the coast of Morocco with a cargo of wheat, "other goods in proportion according to the London and Mediterranean proportionate rates," and she has received loose wool in bags, and the charterer has refused to pay the same rate as if loaded with wool in bales, it has been held that she is entitled to be paid freight according to the quantity she can carry if loaded with wool in bales, $\frac{1}{2}$ ton of 20 cwt.

1407. **Russia**. The average weight of 360 bales of "long white Donskoi Yiesk fleece wool" shipped in August, 1864, at Yiesk, near Taganrog, was 416 lbs. The term Donski is derived from the river Don, on the banks of which immense flocks of sheep are pastured.

1408. **Spontaneous Combustion**. The ship *Orient*, 1,032 tons register left Adelaide 3rd November, 1861, with 2,600 bales wool, some copper, and several passengers. She touched at the Cape, and left 18th December. On the morning of the 2nd January, smoke was observed rising from the fore hatchway, Capt. LAWRENCE immediately ordered the lower deck hatches forward to be lifted, but found no smoke from below, and there being none from the main or after hatches below, he was convinced that the fire must be in the 'tween decks. The hands were turned up, but commenced breaking out the cargo, but after getting to the third beam from the fore hatchway aft, they could remain no longer below. It being still quite clear in the main hatchway, the crew commenced breaking out there, (after putting the fore hatches on and hauling the mainsail up to prevent a current of air), but they were soon obliged to retreat. Provisions, &c.,

were then got up, and the hatches battened down and every aperture was closed. The carpenter first bored augur holes through the deck under the galley, and then further forward until the seat of the fire was reached. The holes were enlarged there, and the fire engine, condensing engine, and all available means used for pouring down water, which was brought up by the ship's pumps, and used again and again. The side scuppers were closed and the deck kept constantly covered with several inches of water. When the holes were not in use for the reception of water, men stood by and stopped them with wads of wool. Meantime the boatswain, aided by the passengers, got provisions and water into the ship's boats which were placed astern. At five p.m., dense smoke poured out from the scuttle under the fore chains, the wood-work was burnt, and the glass bull's-eye melted. The scuttles were however closed, and the deck cut immediately inside this place, when smoke and flames came out in volumes. The crew continued working at the engines all night. On the 3rd the lady passengers were transferred to a Dutch ship commanded by Capt. VANZANTEN. On the 5th, the fire having been completely smothered by the confined smoke and steam, the *Orient* arrived at Ascension, where a large portion of the cargo was taken out, and the perfect bales returned. She was temporarily repaired there, and then navigated to London. Twelve of her timbers were so much burnt and charred that they had to be replaced, as well as all the planking of the main deck, from the main hatchway forward. All the vermin were destroyed. Humanly speaking Capt. LAWRENCE attributes the preservation of his ship in the first place to the total exclusion of air, and in the next to the absence of anything like panic or confusion among the passengers and crew. Capt. VANZANTEN received from the Board of Trade a gold chronometer worth £100; and Capt. LAWRENCE from the underwriters a piece of plate worth £100, and £800 for himself, his officers, and crew.

1409. **Spontaneous Combustion.** The Black Ball Line ship *Fiery Star*, 888 tons, belonging to Messrs. T. M. MACKAY and Co., left Brisbane, Moreton Bay 1st April, 1865, for London, with 63 passengers, a crew of 42, and 2,041 bales and 3 bags wool, 134 casks tallow, 15 hales and 2 bags cotton, 1,519 hides, 9,103 horns, 6 cases arrowroot, and sundry packages. On the 19th, latitude 46° 10' S., longitude 170° W., a strong smell came up from the fore-castle. Capt. YULE and the mate took the fore hatch off, and were horrified to find the smoke rising in clouds from the lower hold. Every hatchway was battened down, and on the 20th the men were employed pumping water on them, and covering them with sails taken from aloft. The passengers were obliged to leave the cabins, the smell of the burning wool, which was impregnated with arsenic (used in cleaning it), having become insufferable. At six in the evening flames burst out from the port bow and through the water-way on deck. The *Fiery Star* had lost two of her boats by a heavy sea which struck her on the 17th. In the remaining four, the captain, all the passengers but one, and most of the crew, embarked. The mate, Mr. SARGANT, said, "Well, lads, I'll stick by you, if you'll stick by the ship," and 17 remained. The steam pumps were worked to keep down the fire, and a raft was commenced. On the 22nd re-patched the hole in the side through which the flames came: wet blankets were applied, and a man stationed at the mast-head to look out for a passing sail. It was necessary to pump ship two hours daily. 23rd, holes cut in deck to let water down; all loose fittings burnt to keep fire under steam-pump. 24th, took fore hatch off, no fire to be seen, but foremast badly burnt in the way of the cables; had to close the hatches again, the smell was so strong; cut away fore topsail and royal, and sent down fore top-

gallant-sail yards. 25th, still pumping to keep the fire down and the ship free : men lived on fowls from the hen-coops ; their styes having been used for the fire, ten pigs became furious and it was necessary to kill them for fear of an attack. 27th, strong gale. 28th, moderate. 29th, tried at the cabins, but was prevented by the arsenical stench. 30th, little material left to keep up the fire. May 2nd, got some coal ; the heat in some parts so great that the pitch in the seams began to melt. 3rd, cut up a boom to make sleepers for the raft ; still pumping water below with the steam-pump, and pumping ship every two hours. 4th, saw two islands (Mercury and Cuvier ?) ; a heavy gale. 5th, course E.N.E. 6th, N.N.E. 7th, N.N.W. 8th, N.W. 9th and 10th, a heavy head sea. 11th, made land bearing W.S.W., distant 26 miles ; saw a ship—the *Dauntless* ; Capt. MOORE sent his life boat. 12th, he came on board, and they abandoned the *Fiery Star*, which at 11.30 p.m., was burnt to the water's edge, and then sank.

1410. The fine new iron ship *Aurora*, 1,755 tons register, when on her first voyage, was destroyed by fire in lat. 39° N., lon. 37° W. She was from Adelaide, South Australia, and a large part of her cargo was composed of "wool in the grease." A Board of Trade inquiry found that she was lost through spontaneous combustion of this wool in the grease.

1411. **Loss of Cargo.** Privy Council, 15th August, 1866. *OHRLOFF v. BRISCALL.* Lord Justice TURNER, in delivering their lordship's opinion, said : This is an appeal from the High Court of Admiralty, in an action brought by the respondents, under the provisions of the Admiralty Act, 1861, as owners and assignees of the bill of lading of 47 casks of oil, against the owners of the *Helena*, in which the oil had been carried from Leghorn to Liverpool. Notwithstanding the evidence of the notoriety at Liverpool, of the deleterious consequences of the collocation of oil in casks with rags and wool, or other matters tending to generate heat, we do not believe that either the shippers or owners in this case were aware of them. If the shippers knew, they knew also that the wool and rags which they made a part of the cargo, must necessarily be stowed, and were in fact stowed, in the single hold of the ship, and with this knowledge we think it impossible that they should have abstained from mentioning the inevitable leakage in her then condition, and from requesting some means to be applied to prevent it, such as by bulkheads. Nor do we think the owners were in a better state of knowledge on the subject, &c. Had they been so, it is inconceivable, as it seems to us, that they should have received a cargo so composed without some remonstrance with the shipper for selecting such mischievous companions to form part of the cargo with the oil. If the owners were ignorant of the consequences, we do not think it amounted to culpable negligence on their part to stow, in the only place they could be stowed, the goods which, under the charter-party, the charterers had a right to insist, and did insist, should form a part of the cargo. On this question it is, in our opinion, very material to consider not only that the charterers did insist, but also that the cargo was, according to the terms of the charter-party, received and stowed as it was presented ; they were shown to be very frequently on board as the stowage progressed, and were well acquainted with the mode (which was effected in a masterly way), and never raised any objection. Nor do we think the ignorance of the owners in itself amounted to negligence. It can hardly be imputed as misconduct that the owners should be ignorant of latent mischief of this nature when LLOYD and Co., who are proved to have had very great experience as oil merchants, were equally ignorant. But even if the appellants knew, or ought to have known, what the

consequences must be, we are not prepared to say they were guilty of negligence in not putting up bulkheads. Assuming that they could have been so constructed as to protect the part of the hold where the oil was stowed from the influence of the heat generated by the wool and rags, still this could not have been done without much trouble and considerable expense, which we cannot concede that the shippers had a right to throw on the owners, because the shippers chose to load the ship with a cargo of such a nature. And to this we may add, even supposing the owners to have been aware of the usual consequences, they might have well come to the conclusion that the shippers were also aware of them, and would not put such a cargo on board unless they had been assured that the casks were of such extraordinary strength and goodness as to be capable of resisting the usual influence of a heated temperature. For these reasons we think the respondents failed to prove that the leakage was attributable to appellant's negligence. It may be observed that the learned judge of the Admiralty Court appears to have adopted a construction of the word "leakage" contended for by the respondents, viz., that it means "ordinary leakage" only, and consequently the judgment adverts but little, if at all, to the question whether negligence on the part of the owners had been proved. But we do not think such a construction allowable. The condition that the shipowners are not to be accountable for leakage does not, in its ordinary and grammatical sense, put any limit to the quantity of leakage, and on principle, therefore, we do not think it would be justifiable to add any such limit to its terms. Nor are we aware of any authority for doing so. It follows that, in our judgment, the memorandum protects the shipowner as to all leakage except that caused by negligence, and, therefore, if no negligence is shown, there is no cause for action. Another point was raised and argued before us, viz., that the conduct of the shippers as to the stowage was such that it would support a plea of leave and license by the shippers, if the action had been brought by them. But it was contended on behalf of the respondents that by reason of the Bills of Lading Act, 18 and 19 vic., cap. 3, such a plea was not allowable in an action by the indorsees of the bill of lading. It is unnecessary, however, to decide this point, as our opinion is against the respondents on the question of negligence. On these grounds their lordships will humbly advise Her Majesty that the judgment of the Court of Admiralty should be reversed, with costs both in the Court below and on this appeal.

1412. **Wool and Oilcake.** Court of Exchequer, 14th July, 1867. Before Lord Chief Baron. **ISRAEL v. WILSON.** In June, 1866, the steamer *Ouse* shipped at Stettin 159 bales wool. Bill of lading stated "contents unknown, and not responsible for weight, measure, leakage, breakage, or damage." The steamer called at Copenhagen, and shipped 20 tons of oilcake, near which and some spelter in the fore hold 39 bales of wool were stowed. On discharge at Hull these bales were said to be damaged by the cake which was in bulk, loose, and supposed to be heated. For the defence it was alleged that on the rape cake in the fore peak bags of bran were placed, and that they were discharged uninjured. The wool was right against the bran; spelter on the wool; wool again; and then spelter. Wool also in the wings, with a space under the main hatchway to receive the cake taken in at Copenhagen. Mats were placed between the oilcake and the wool, and below the oilcake and the spelter. The cake did not heat, and one witness averred that he had heated some up to 200° and subjected it to hydraulic pressure up to 300 tons, without being able to subtract sufficient oil to wet the bags containing it. Evidence was very conflicting. Verdict for the ship.

Tonnage. 4'444 tons wool, and 5'257 compressed, will occupy 850 cubic feet or 1 keel. E.I. Co. 10 cwt. carmenia wool to a ton; Bengal, Madras, and Bombay 50 cubic feet in screwed bales go to a ton; at New York 40 cubic feet.

Proportionate Rates. When Mediterranean wheat is freighted at 1s. $\frac{1}{4}$ quarter, wool in bales is rated 18s. 9d. $\frac{1}{4}$ ton of 20 cwt. Compressed should be 9-10ths more than clean hemp $\frac{1}{4}$ ton of 20 cwt., and un-compressed 125 $\frac{1}{4}$ cent. more, or 2 $\frac{1}{2}$ times the rate of clean hemp. Baltic wool receives double freight of clean hemp $\frac{1}{4}$ ton of 63 poods gross. Black Sea wool is rated at 90s. $\frac{1}{4}$ ton of 63 poods freight, when tallow is 30s.; see table at commencement. "Spanish wool" pays 262 $\frac{1}{4}$ cent. more than the freight of tallow; and merino, &c., 386 $\frac{1}{4}$ cent. more than wheat $\frac{1}{4}$ ton.

Weights. Russian bales are 3 $\frac{1}{2}$ to 4 cwt. each; German 3 to 4 cwt.; Bremerhaven stone 10lbs.; Rotterdam last 2,000 lbs.; Spanish and Portuguese bale 1 to 2 cwt.; Turkey quintal or cantaro=44 okes; Egyptian 36 okes; Smyrna chequee goat's wool 558 lbs.; S. American bales 4 $\frac{1}{2}$ to 8 cwt.; goat's 1 $\frac{1}{2}$ to 2 cwt.; East Indian 3 to 4 cwt.; Bombay candy 518 lbs.; Peruvian bale 56 to 84 lbs. Australian bales 2, 2 $\frac{1}{2}$, 3, and 3 $\frac{1}{2}$ cwt., averaging 3 cwt. S. Australian 4, 5, 6, and 7 cwt. averaging 410 lbs. in the grease; the heavy bales are very rare. Freight at $\frac{1}{4}$ lb.; say $\frac{1}{2}$ d. greasy, and 1d. washed, according to arrangement.

Wool Weight. In some English counties, wool is purchased of the growers by the tod of 28 lbs., in others by the stone 14 lbs. In Devon and Cornwall (where it is shorn in the grease) at $\frac{1}{4}$ lb. The score in Devon 21 lbs.; Cornwall 20 lbs. In the manufacturing towns the sale is by the pack of 240 lbs., or at $\frac{1}{4}$ lb. only; in the former by £ per pack; in the latter pence per lb.; as 240 pence are £1, the £ or pence the same, and the odd weight, if any, would be scores or lbs.

14 lbs.=1 Stone. 20 lbs.=1 Score.

28 lbs.=1 Tod. 240 lbs.=1 Pack.

Lately wool has been packed in odd weights as cwt., qrs., lbs.; the actual tare taken off and the net reduced to lbs., and reckoned as such. All sales of colonial wool at $\frac{1}{4}$ lb. A sarplar is a large bale or package containing 80 tods or a ton.

1413. **WRAPPERS.** It has been held at San Francisco that where the contents of a bale, rope for instance, are uninjured, the ship is not liable, although the wrapper may be chafed.

1414. **WRECK**, in navigation, is understood to mean any ship or goods driven ashore, or found floating in a deserted or unmanageable condition. Legally, *wreck* must have come to land; when at sea it is distinguished by the terms flotsam, jetsam, and lagan; *flotsam* is when goods continue on the surface; *jetsam* is when they are sunk under the surface; and *lagan* is when they are sunk, but tied to a rock or buoy, to be found again. If any person finds or takes possession of any wreck, he shall, as soon as possible, deliver same to receiver of wreck. Wreck means jetsam, flotsam, lagan, or derelict.—Merchant Seaman's Act, sec. 450.

1415. **ZEA**, Indian corn or maize.

1416. ZEDOARY, the root of a plant which grows in Malabar, Ceylon, Cochin China, &c., of which there are three different species. It is brought home in pieces of various sizes. Bombay ton 20 cwt.

1417. ZINC or SPELTER ; a metal of a brilliant white colour, with shade of blue, composed of a number of thin plates adhering together. Specific gravity of melted zinc varies from 6·861 to 7·1. **Zinc Sulphate**, or White Vitriol, is soluble in water ; it is packed in casks of five or six cwt.

1418. ZINC SHEET. Rolls of Sheet Zinc are sometimes packed in cylindrical cases, say six feet long by two feet diameter. About 60 of these, 30 cwt. each, shipped in London, were placed in the bottom, and on them general cargo, including some hogsheads of Birmingham or other heavy goods. On arrival at Auckland, five or six of the cylinders were found to be so much crushed that the zinc had come in contact and had been damaged by bilge-water, for which the ship had to pay nearly £100.

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